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'SUB #4' USERS GUIDE: IBM-PC/AT COMPUTER CALCULATION OF LONGWALL SUBSIDENCE PROFILES USING THE NCB SUBSIDENCE ENGINEERS HANDBOOK

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by

D.D. Ziuck* and T.R.C. Aston**

SUMMARY

This report describes the program 'SUB #4' which undertakes the computer calculation and plotting (using both an EPSON FX100 dot matrix printer and a TAXAN XY plotter) of longwall subsidence profiles using the National Coal Board (United Kingdom) Subsidence Engineers Handbook. Both transverse and longitudinal subsidence profiles are calculated and plotted. The program, which was originally written in G-BASIC for the North Star microcomputer, has been rewritten in BASIC A Version 3.10 for use on an IBM-PC/AT.

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GUIDE DE L'USAGER "SUB #4": CALCUL DES PROFILS DE LA SUBSIDENCE DE L'EXPLOITATION PAR LONGUES TAILLES SUR ORDINATEUR IBM-PC/AT À L'AIDE DU "NCB SUBSIDENCE ENGINEERS HANDBOOK"

par

D.D. Zinck* et T.R.C. Aston**

RÉSUMÉ

Le présent rapport décrit brièvement le programme "SUB #4" qui effectue le calcul sur ordinateur et le traçage de courbes (avec l'emploi d'une imprimante par matrice de points EPSON FX100 et d'un traçeur de courbes TAXAN XY) des profils de la subsidence de l'exploitation par longues tailles à l'aide du "National Coal Board" (Royaume-Uni) "Subsidence Engineers Handbook". On a calculé et traçé les profils transversal et longitudinal de la subsidence. Au départ, ce programme avait été écrit en langage G-BASIC pour le micro-ordinateur North Star, il a depuis été réécrit en BASIC A Version 3,10 pour être utilisé avec l'ordinateur IBM-PC/AT.

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INTRODUCTION

The extraction of coal by longwall techniques, where the waste area is left to cave naturally, results in the formation of a subsidence trough or profile at the ground surface. The resulting subsidence trough can cause serious damage to overlying surface structures.

During the 1950's, the National Coal Board (NCB) in Great Britain undertook an extensive research program to understand and predict the magnitude and effects of subsidence profiles using empirical techniques. In 1965, the NCB Subsidence Engineers Handbook (SEH) was first published, which allowed the accurate prediction (±10%) of longwall subsidence profiles for a variety of conditions. A revised edition of the NCB SEH was subsequently issued in 1975 (1).

It should be noted that the NCB SEH is often viewed as a definitive work on subsidence prediction by many countries of the world. However it is often difficult, especially when using empirical techniques, to quantify the effects of individual parameters such as geology or the presence of existing workings in adjacent seams on the eventual profile magnitude. A variety of difficulties have therefore arisen when applying the SEH directly to the coalfields of other countries: the U.S.A. or Australia. However, the NCB SEH for all its limitations can give a good indication of the probable magnitude of subsidence profiles, providing that conditions within the coalfield to which it is applied are comparable to those found in U.K. coalfields.

This report describes the program 'SUB #4' which undertakes the computerised calculation and plotting of subsidence profiles using the procedures given in the NCB Subsidence Engineers Handbook (1).

PROGRAM 'SUB #4'

The program 'SUB #4' is written for use on an IBM-PC/AT and requires for its operation:

512 kB of RAM
360 kB floppy drive
BASIC A VER 3.10

DOS VER 3.10
FX100 printer
TAXAN XY plotter

A list of the files used on the program operating disk is given in Table 1. However, it should be noted that:

1) the file 'CONFIG.SYS' contains the necessary information to create the ram disk:

```
DEVICE = C: \ VDISK.SYS 360 512 64
```

2) the file 'AUTOEXEC.BAT' automatically loads and executes the program:

```
ECHO OFF
BREAK OFF
COPY A:  DATA?.*D:
BASIC A SUB#4.BAS/S:  256
ECHO ON
```

To operate the program, the following data must be input:

Mine Name	Seam Thickness (m)
Seam Name	Panel Length (m)
Panel Number	Panel Depth (m)
Panel Width (m)	

NOTE: All input parameters must be input as metric units.

The program also requests either the average main and tailgate elevations or the seam gradient in order to determine whether a correction must be applied to the tensile strain profile (1). If a correction is required, the maximum tensile strain value is corrected for the effects of the seam gradient and the new values displayed. However, the corrected values <u>are not</u> substituted into the subsequent calculations in order to

COMMAND.COM	- DOS VER 3.10
SUB#4 .BAS	- SUBSIDENCE PROGRAM
SUBDOC .BAS	- SUBSIDENCE DOCUMENTATION
SUBGRAF.BAS	- TAXAN PLOTTING ROUTINE
GRAPHH .BAS	- SCREEN PLOTTING ROUTINE
DATA 1	DATA FILES 1-7 FOR CALCULATION
DATA 2	
DATA 3	
DATA 4	
DATA 5	
DATA 6	
DATA 7	
CONFIG.SYS	- SETS UP RAMDISK
AUTOEXEC.BAT	- AUTOMATICALLY LOADS AND EXECUTES PROGRAM
BASIC A.COM	- COPY OF THE BASIC PROGRAM
TPLT 1	DATA FILES 1-4 CREATED BY PROGRAM FOR GRAPHICS USE
TPLT 2	
TPLT 3	
TPLT 4	

Table 1 - Files used on the program operating disk

derive a new transverse strain profile. The user is expected to be familiar with the operation of microcomputers and the concept of subsidence profile calculations using the NCB SEH (1).

A documentation program 'SUBDOC' is located at the beginning of 'SUB #4' in order to provide the user with a description of the main program. The 'SUB #4' program operates via a series of user friendly menus.

PROGRAM DESCRIPTION

A listing of the documentation program 'SUBDOC' is given in Appendix A, while a listing of the main program 'SUB #4' is given in Appendix B. Additional listings of the printer graphics, 'GRAPHH.BAS', and plotter graphics, 'SUBGRAF.BAS', programs are given in Appendices C and D.

Line No.	
10 - 140	Program header
150 - 190	Initialize screen
200 - 240	Program description (call 'SUBDOC.BAS')
250 - 300	Program dimension statements
310 - 350	Batch mode prompt
360 - 510	Service menu (program operations)
520 - 830	Data entry for calculation
840 - 1180	Data file searching routine
1190 - 1280	Initialize printer
1290 - 1320	Prints title
1330 - 1480	Prints colliery data
1490 - 1680	Calculation for traverse subsidence
1690 - 1840	Calculates distances to panel center
1850 - 2040	Calculates maximum strain values
2050 - 2280	Calculates traverse strain profile
2290 - 2340	Calculates travelling subsidence
2350 - 2510	Calculates longitudinal subsidence values
2520 - 2770	Calculates travelling strain profile
2780 - 2840	Subroutine for underline mode

2850 - 3140	Subroutine to find maximum subsidence factor
3150 - 3320	Subroutine to correspond w/h ratio with data table search
3330 - 3400	Data statements
3410 - 3480	Searchs for depths between 10 and 50 meters
3490 - 4520	Creates data files for graphics
4530 - 4550	Call graphics routine ('SUBGRAF.BAS')
4560 - 4880	Subroutine for opening data files
4990 - 5360	Batch entry subroutine

PROGRAM USE

'SUB #4' uses a series of service menus to direct the operation of the program.

A listing of the output file is given in Table 2, while the output graphics for the printer are shown in Figures 1 and 4 and for the plotter in Figures 5 to 8.

The data files which consist of digitised values obtained from the graphs contained in the NCB SEH (2), are given in Appendices E to K:

Appendix E - DATA 1 - Maximum subsidence factors (s/m).

Appendix F - DATA 2 - Transverse subsidence profile, relationship between w/h and d/h for various points on the profile.

Appendix G - DATA 3 - Maximum tensile and compressive strain factors for various w/h ratios.

Appendix H - DATA 4 - Transverse strain profile, relationship between w/h and d/h for various points on the profile.

Appendix I - DATA 5 - Longitudinal subsidence profile distance factors.

Appendix J - DATA 6 - Longitudinal strain profile distance factors.

Appendix K - DATA 7 - Correction factors for the effect of seam gradient on tensile strain.

N.C.B. SUBSIDENCE ENGINEERS HANDBOOK
SUBSIDENCE CALCULATIONS

AREA CBOC COLLIERY LINGAN SEAM HARBOUR DISTRICT/PANEL 9 EAST

PANEL WIDTH (m) 180.00 SEAM THICKNESS (m) 2.00 PANEL LENGTH (m) 1000.00

PANEL DEPTH (m) 135.00 w/h ratio = 1.33 S/m = 0.85

∴ S =1.70

Subsidence as s/S	0.00	0.05	0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	0.95	1.00
Subsidence in meters	0.00	0.09	0.17	0.34	0.51	0.68	0.85	1.02	1.19	1.36	1.53	1.62	1.70
Distance in meters from panel center	189.00	122.85	108.00	94.50	86.40	81.00	75.60	70.20	64.80	58.05	47.25	36.45	1.35
DISTANCE IN TERMS OF h from panel center	1.40	0.91	0.80	0.70	0.64	0.60	0.56	0.52	0.48	0.43	0.35	0.27	0.01

MAXIMUM STRAIN FACTORS

+E = .65 S/h where S/h = 12.59 mm -E = 0.50S/h

= 8.19 mm/m = 6.30 mm/m

INCLINED SEAM TENSILE STRAIN CORRECTION GRADIENT= 4.50 RISE= 4.91 m DIP= 11.46 m

TRANSVERSE STRAIN PROFILE

EXTENSION +E COMPRESSION -E

e/E	0.00	0.20	0.40	0.60	0.80	1.00	0.80	0.00	0.20	0.40	0.60	0.80	1.00	0.80	0.60	0.40	0.20	0.00
	0.00	1.64	3.27	4.91	6.55	8.19	6.55	0.00	1.26	2.52	3.78	5.04	6.30	5.04	3.78	2.52	1.26	0.00

h =	189.00	132.30	117.45	109.35	101.25	94.50	89.10	75.60	71.55	68.85	64.80	60.75	52.65	40.50	27.00	27.00	13.50	0.00
M	1.40	0.98	0.87	0.81	0.75	0.70	0.66	0.56	0.53	0.51	0.48	0.45	0.39	0.30	0.20	0.20	0.10	0.00

TRAVELLING SUBSIDENCE PROFILE

Perpendicular to face center m	11.475	-2.025	-16.875	-24.975	-31.725	-39.150	-45.900	-54.000	-60.750	-78.300	-93.825
	0.085	-0.015	-0.125	-0.185	-0.235	-0.290	-0.340	-0.400	-0.450	-0.580	-0.695

Subsidence in (m)	0.05	0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	0.95
	0.09	0.17	0.34	0.51	0.68	0.85	1.02	1.19	1.36	1.53	1.62

TRAVELLING STRAIN PROFILE (mm/M)

Perpendicular to	44.28	25.92	17.69	11.48	5.40	-4.73	-11.48	0.00	-28.35	-33.08	-37.80	-43.20	-56.70	-71.55	-81.00	NA	NA	NA
To face center m	0.328	0.192	0.131	0.085	0.040	-0.035	-0.085	0.000	-0.210	-0.245	-0.280	-0.320	-0.420	-0.530	-0.600			

e/E:	0.00	0.20	0.40	0.60	0.80	1.00	0.80	0.00	0.20	0.40	0.60	0.80	1.00	0.80	0.60	0.40	0.20	0.00
	0.00	1.64	3.27	4.91	6.55	8.19	6.55	0.00	1.26	2.52	3.78	5.04	6.30	5.04	3.78	2.52	1.26	0.00

Table 2 - Output file - subsidence and strain profile data

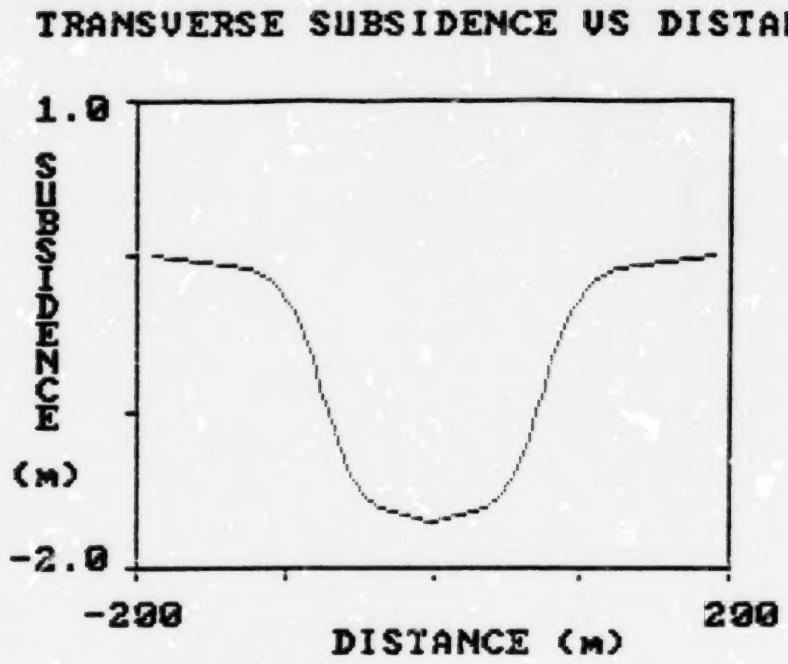

Figure 1 - Transverse subsidence profile (printer)

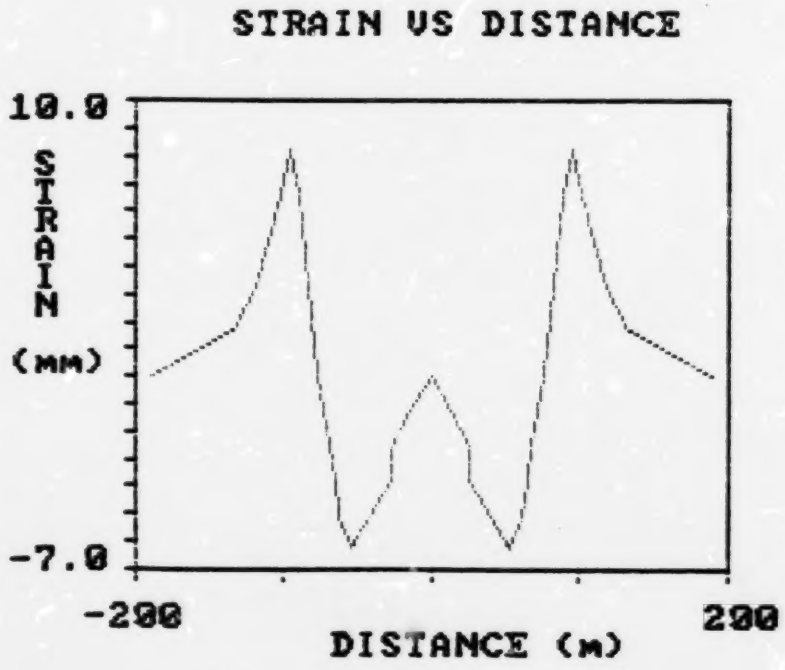

Figure 2 - Transverse strain profile (printer)

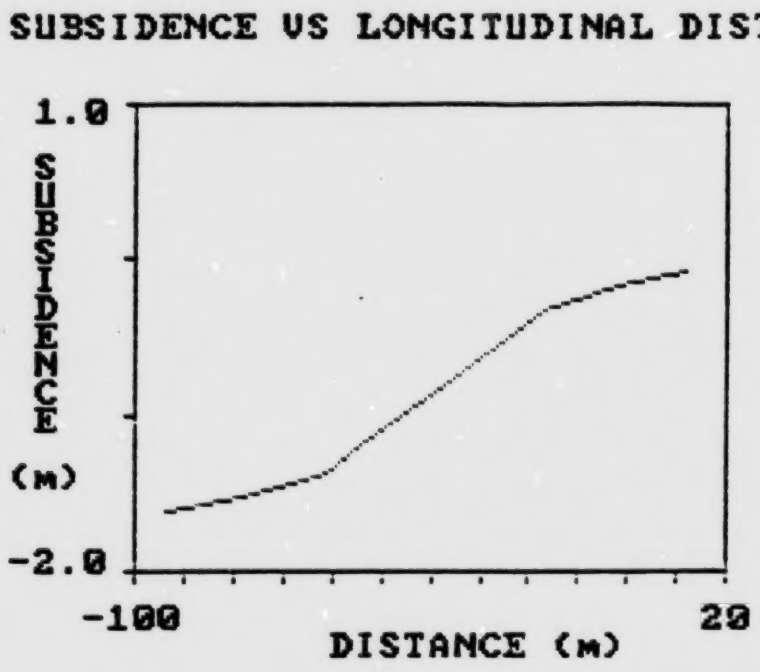

Figure 3 - Longitudinal subsidence profile (printer)

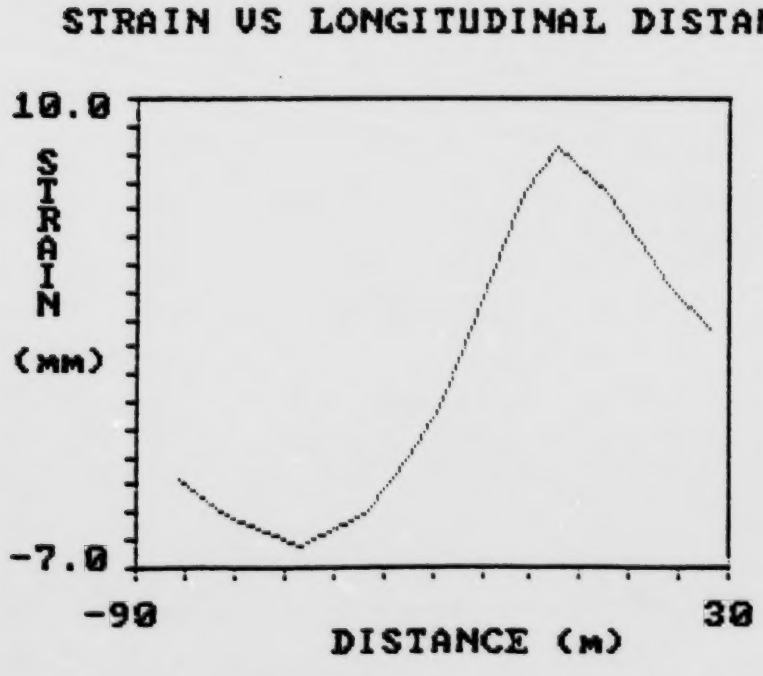

Figure 4 - Longitudinal strain profile (printer)

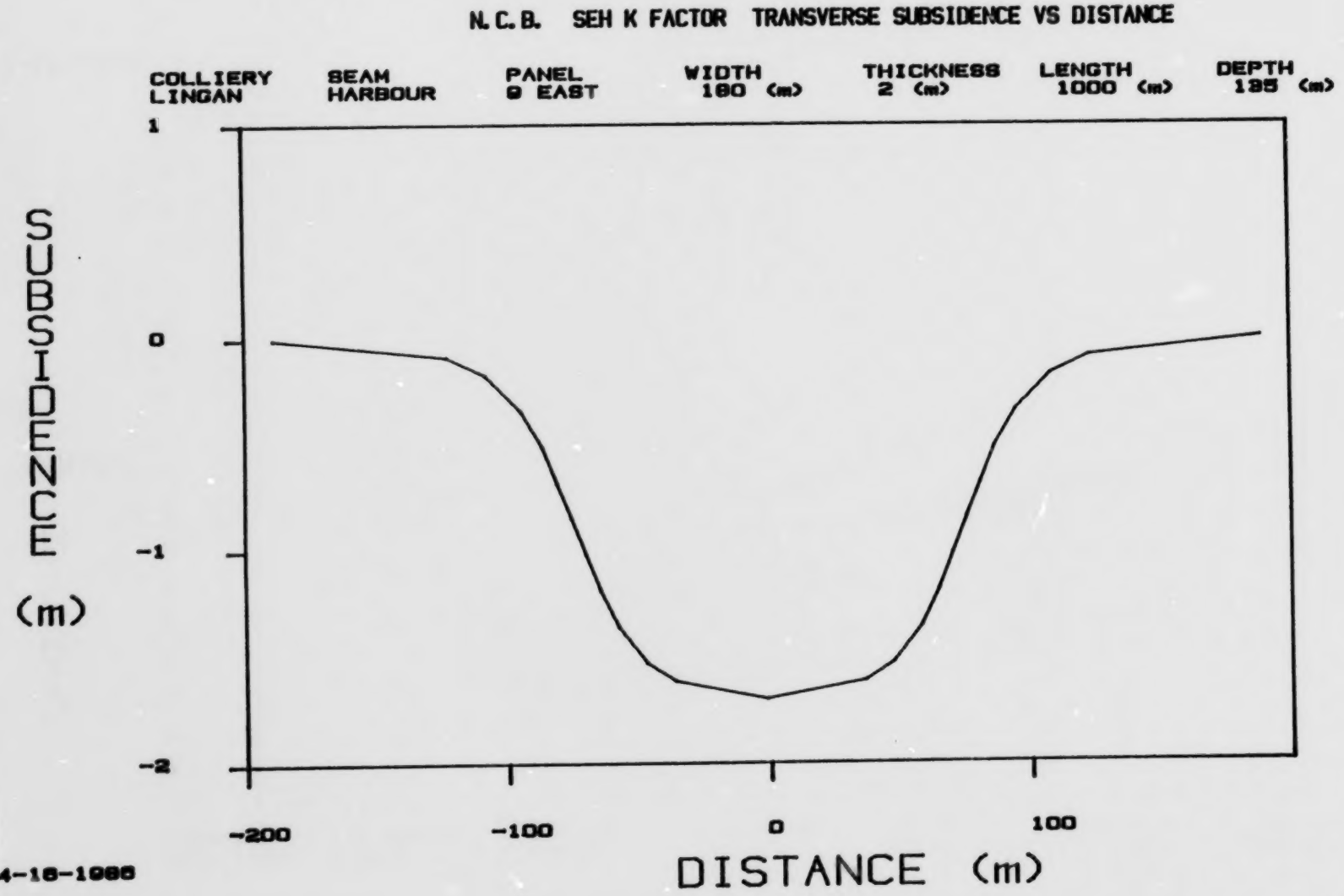

Figure 5 - Transverse subsidence profile (plotter)

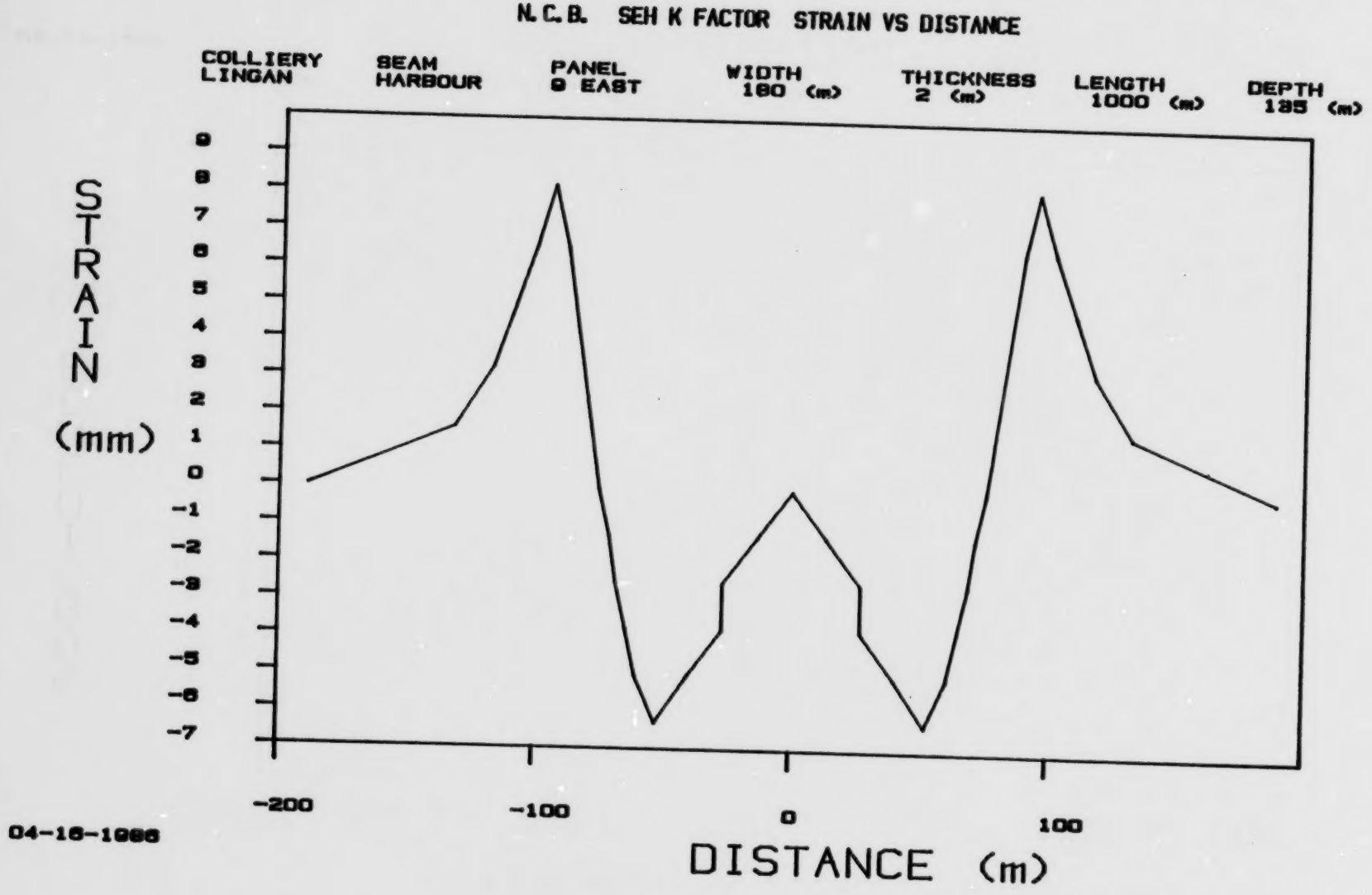

Figure 6 - Transverse strain profile (plotter)

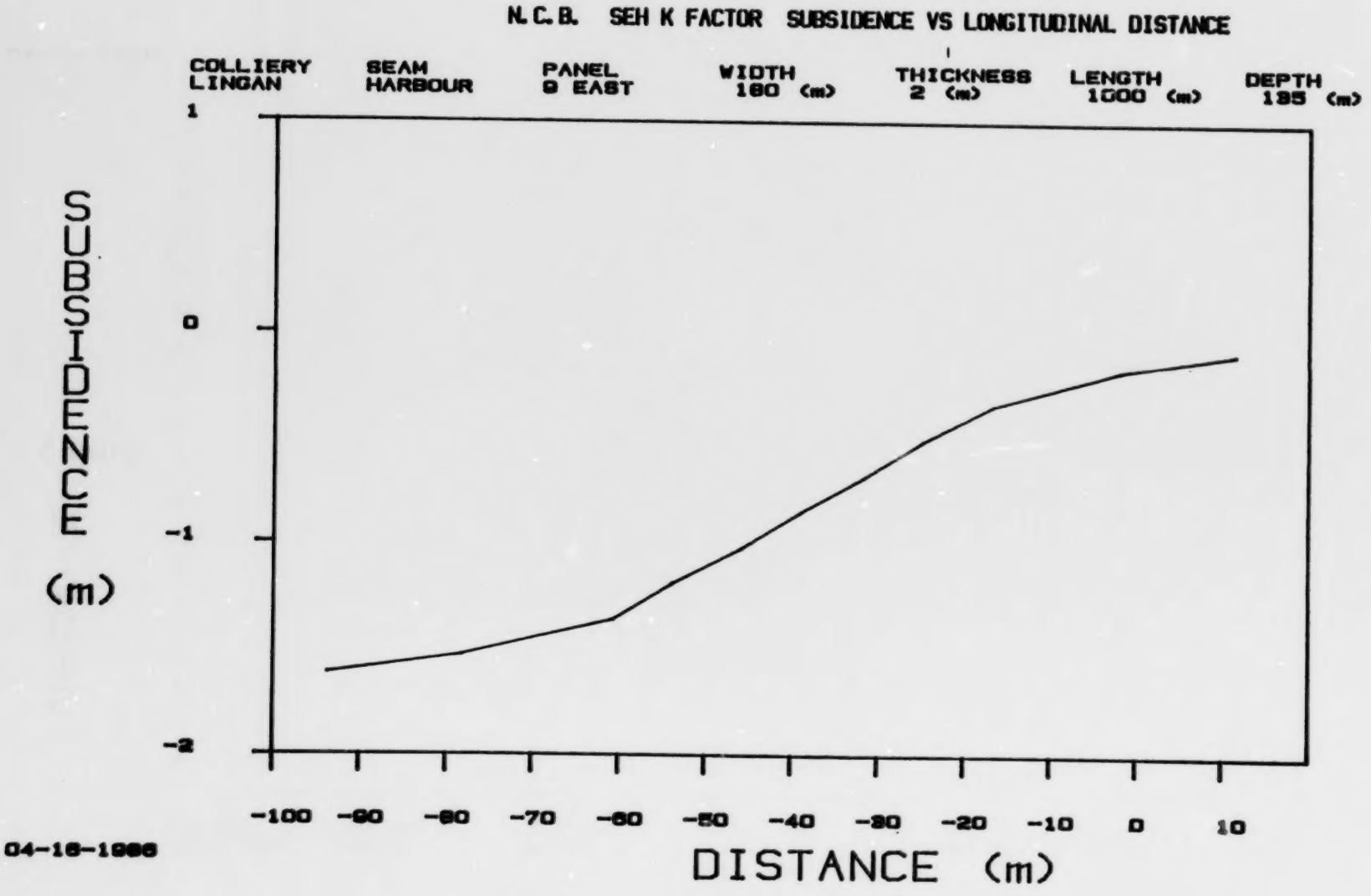

Figure 7 - Longitudinal subsidence profile (plotter)

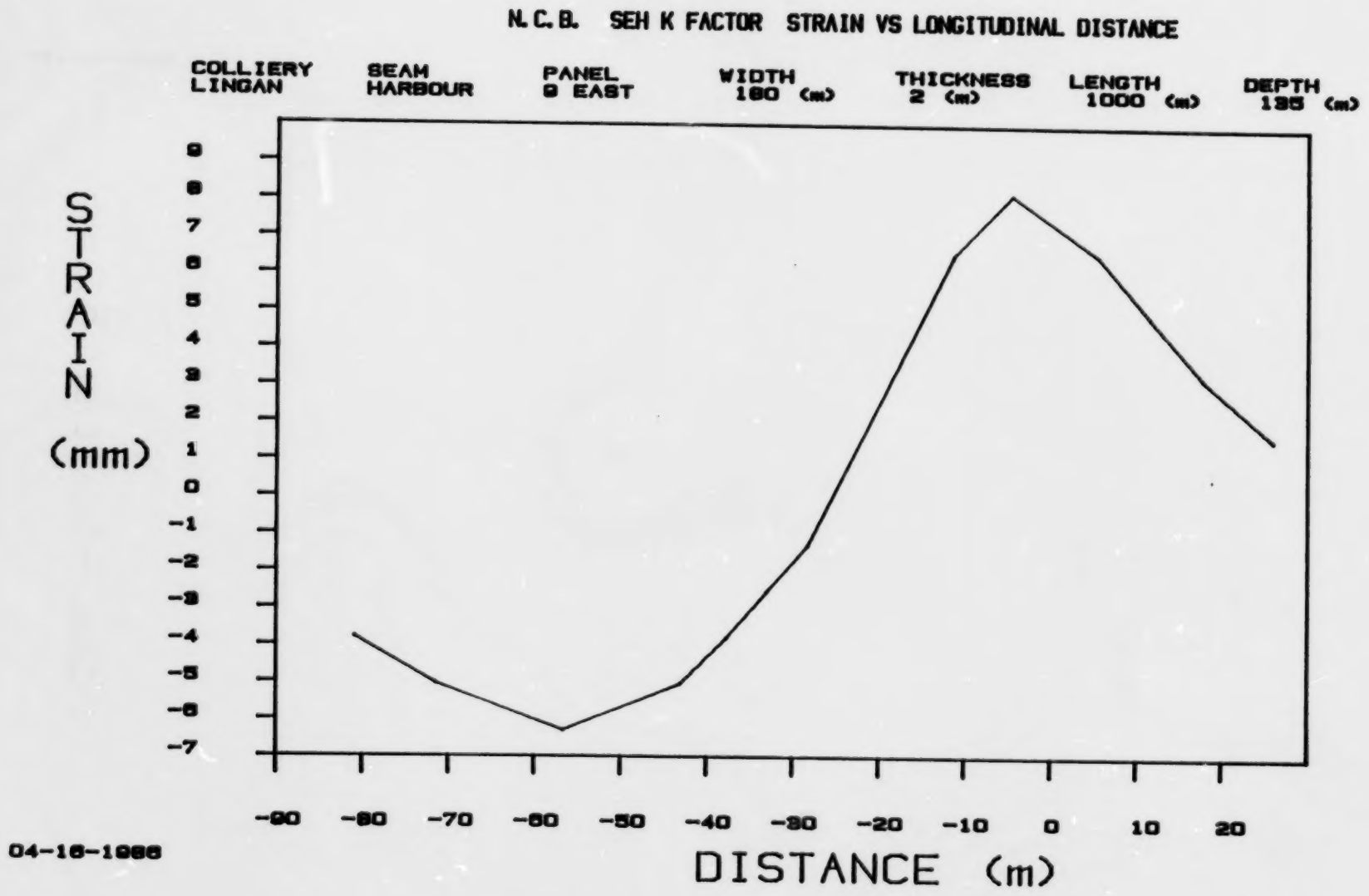

Figure 8 - Longitudinal strain profile (plotter)

ACKNOWLEDGEMENTS

A program to undertake the calculation of transverse and longitudinal subsidence profiles using the methods outlined in the National Coal Board Subsidence Engineers Handbook has already been written in G-BASIC language for the North Star microcomputer (3). The authors would therefore like to acknowledge the discussions undertaken with and help provided by Mr. D. Young of the CANMET Cape Breton Coal Research Laboratory in converting the original North Star program for use on the IBM-PC/AT.

REFERENCES

1. National Coal Board (U.K.); "Subsidence Engineers Handbook"; Mining Department; London 1975.
2. Aston, T.R.C. "Prediction of longitudinal and subsidence profiles with width/depth ratios in excess of 3.0 using National Coal Board Methods"; Division Report ERP/CRL 86-80(TR); CANMET, Energy, Mines and Resources Canada; 1986.
3. Young, D.A. and Aston, T.R.C. "'SUB #4' users guide: Computer calculation of longwall subsidence profiles using the NCB Subsidence Engineers Handbook"; Division Report ERP/CRL 86-3(TR); CANMET, Energy, Mines and Resources Canada; 1986.

APPENDIX A - SUBDOC.BAS

```
10 REM ********************************************************************
20 REM ***                                                              ***
30 REM ***              SUBSIDENCE  DOCUMENT  PROGRAM                   ***
40 REM ***              ----------------------------                    ***
50 REM ***                                                              ***
60 REM ***          Written by:  Derrick Zinck                          ***
70 REM ***                                                              ***
80 REM ********************************************************************
90 REM
100 KEY OFF :COLOR 9,0,9: CLS
110 REM
120 LOCATE 2,32 : PRINT"Program Function"
130 LOCATE 3,31 : PRINT"-----------------"
140 PRINT"       Program SUB#4 main purpose is to provide quick calculation"
150 PRINT"of empirical susidense parameters reguarding troughing in the Sydney"
160 PRINT"Coal Field Basin.  The information used to reach these these results"
170 PRINT"is contained in seven data files in which five have been copied from"
180 PRINT"a British Engineers Subsidence Handbook.  These values have been ex-"
190 PRINT"trapolated to depths of 750 meters.  (1) Aston T.R. (description)"
200 PRINT"FILE NAME                          Description"
210 PRINT
220 PRINT" DATA1                  This file contains max subsidence factors from
"
230 PRINT"                       a contour diagram relating width to height ratio
s"
240 PRINT"                       in E S Handbook.  The file is 40 by 89 GRID of d
ata"
250 PRINT"                       numbers.  The file contains factors for width an
d"
260 PRINT"                       height values ranging from (10 to 400 m at 10 m
"
270 PRINT"                       intervals) and (10 to 50 m and 50 to 850 m at 10
 m"
280 PRINT"                       intervals) respectively."
290 PRINT"                         Max subidence values range from .02 to .92 ."
300 PRINT"                       Intermediate values are brought to the nearest p
oint"
310 PRINT
320 SOSLS 99.
330 PRINT
340 PRINT" DATA2                  This file was copied from the E S Handbook.  I
t"
350 PRINT"                       Contains W/H factors used in calculating the tra
verse"
360 PRINT"                       distance from the panel center for 5,10,20,30...
to
370 PRINT"                       100% subsidence.  It contains w/H ranging from .
2 to 14"
380 PRINT"                       The file is a 108 rows by 14 columns file."
390 PRINT
400 PRINT" DATA3                  As above this file contains W/H relating max t
ensile"
410 PRINT"                       and max compressive strain values in both the tra
verse"
```

```
420 PRINT"                    and longitudinal calculations.  It contains W/H R
anging"
430 PRINT"                    from .2 to 14 .  The file is 108 rows by 3 colum
s."
440 PRINT
450 PRINT" DATA4                As above except this file contains W/H traverse
"
460 PRINT"                    distance from panel center and percent tensile th
rough"
470 PRINT"                    percent compressive strain.  It contains W/H rang
ing"
480 PRINT"                    from .2 to 14 . The file is 108 rows by 3 columns
."
490 PRINT
500 GOSUB 990
510 PRINT
520 PRINT" DATA5                As above this file contains depth values relati
ng"
530 PRINT"                    distance perpendicular to and across the face cen
ter"
540 PRINT"                    against 5,10,20,...,100% longitudinal subsidence.
"
550 PRINT"                    The depth number range from 10 to 750 meters. The
"
560 PRINT"                    file is 114 rows by 12 columns."
570 PRINT
580 PRINT" DATA6                As above this file contains depth values relati
ng"
590 PRINT"                    distance perpendicular to and across the face cen
ter"
600 PRINT"                    against tensile and compressive strain.  This fil
e"
610 PRINT"                    contains depths ranging from 10 to 750 meters."
620 PRINT"                    The file contains 18 rows by 3 columns."
630 PRINT
640 PRINT" DATA7                This file contains gradiant values used in maki
ng"
650 PRINT"                    corrections in max tensile strain calculations."
660 PRINT"                    The file contains gradient values ranging from 0
to 10
670 PRINT"                    The file is 18 rows by 3 columns."
680 PRINT
690 GOSUB 990
700 PRINT"Input Parameters -  The user is required to supply the following infor
mation:"
710 PRINT"Name of colliery, seam, district, panel width, extracted seam, height,
 panel"
720 PRINT"length, depth of coverage and depths at the top and bottom of the pane
l."
730 PRINT
740 PRINT"                              PROGRAM OPERATION"
750 PRINT"                              ----------------"
760 PRINT"      The program begins operation by attaining and calculating the ma
ximum"
```

```
770 PRINT"subsidence value (DATA1)."
780 PRINT"      Secondly it calculates the traverse distance to the panal center
"
790 PRINT"for 0,5,10,20,...,100% of the maxium subsidence accurence."
800 PRINT"      Next, the program calculates the maxium strain values (tensile a
nd "
810 PRINT"compressive) using factors cooresponding to the W/H values in (DATA3).
"
820 PRINT" (Note -  If the gradient value between levels is of sufficient magnit
ude"
830 PRINT"a correction factor is applied to the maxium tensile value.  In normal
 "
840 PRINT"DEVCO longwall mines this on the most part is negligible.  From this i
nfor-"
850 PRINT"mation values for 0 to 100 to 0 percent maxium strain and 0 to 100 to
0"
860 PRINT"percent maxium compressive strain by intervals of 20 % are calculatec
"
870 PRINT"for traverse distances to the face center.  The distances are calculat
ed"
880 PRINT"using factors cooresponding to the W/H value in (DATA4).  Each distanc
e "
890 PRINT"matches a strain value as stated above to the face center."
900 GOSUB 990
910 PRINT"      The next two sections calculate percent subsidence and strain va
lues"
920 PRINT"for distances perpendicular to the face center respectively.  Both set
s of"
930 PRINT"calculations are carried using the same methods for traverse calculati
ons."
940 PRINT"      All values calculated are provided in an explanatory hard-copy."

950 GOSUB 990
960  CLS: PRINT"        This is the end of SUB#4 information....."
970 GOTO 1020
980 END
990 LOCATE 23,10 : PRINT" Press RETurn to continue or E to escape":FOR A=1 TO 20
0:NEXT: LOCATE 23,10 : PRINT" Press    urn to continue or   to escape
1000 A$=INKEY$: IF A$= "" THEN FOR A= 1 TO 100 : NEXT: GOTO 990 ELSE IF A$="E" O
R A$="e" THEN 1020 ELSE CLS : RETURN
1010 GOTO 1030
1020 PRINT" Returning to SUB#4 program mode": FOR I= 1 TO 2500: NEXT : CHAIN sub
#4"
1030 CLS
1040 RETURN
```

APPENDIX B - SUB#4.BAS

```
10 REM ************************************************************************
*****
20 REM ***                                                                  ***
30 REM ***                    PROGRAM  SUB84                                ***
40 REM ***                   ------------------                             ***
50 REM ***                                                                  ***
60 REM ***    Rewritten by:   Derrick Zinck                                 ***
70 REM ***    Original  by:   David Young                                   ***
80 REM ***                    Department of Energy Mines & Resources        ***
90 REM ***                    CANMET/CRL Cape Breton                        ***
100 REM***                    210 George St.                                ***
110 REM***                    Sydney,   Nova Scotia                         ***
120 REM***                    Canada    B1P 1J3                             ***
130 REM***                                                                  ***
140 REM************************************************************************
150 REM

        DIMENSION ARRAYS
160 REM
170 DIM A$(20),B$(20),C$(20),D$(20),F$(20),A(20),B(20),C(20),D(20),E(20),F(20)
180 DIM H(50),H1(50),H2(50),H3(50),H4(50),H5(50),H6(50),H7(50)
190 DIM AA(300),BB(300),CC(300),DD(300)
200 DIM PP(300),PP1(300),GRADD(300)
210 REM

           SET UP THE SCREEN
220 REM
230 KEY OFF: SCREEN 2,1
240 SCREEN 0,0,0
250 COLOR 0,2,10
260 REM

         MAIN MENU PROMPT
270 REM
280 CLS:LOCATE 2,35: PRINT "MAIN MENU"
290 LOCATE 4,30 : PRINT "1)...PROGRAM DESCRIPTION"
300 LOCATE 5,30 : PRINT "2)...ENTER BATCH MODE"
310 LOCATE 6,30 : PRINT "3)...ENTER COLLIERY DATA"
320 LOCATE 8,44 : PRINT "Choice: ";:Z$=INPUT$(1)
330 IF Z$="1" THEN 360
340 IF Z$="2" THEN 5180
350 IF Z$="3" THEN 370 ELSE 280
360 CHAIN "SUBDOC.BAS"
370 GOSUB 540 : GOSUB 950
```

```
380 REM

                        SERVICE MENU
390 REM
400 REM
410 COLOR 2,0,8 : CLS
420 LOCATE 2,33:PRINT"Service Menu"
430 LOCATE 4
440 PRINT SPC(26);"(1).....Hard-copy of results"
450 PRINT SPC(26);"(2).....Graphics"
460 PRINT SPC(26);"(3).....Another calculation"
470 PRINT SPC(26);"(4).....End session"
480 PRINT:PRINT SPC(33);:INPUT"Choice ";L
490 L=INT(L): IF L=1 THEN GOSUB 1320
500 IF L=2 THEN GOTO 3670
510 IF L=3 THEN CHAIN"SUB84.BAS"
520 IF L=4 THEN COLOR 7,0,0 : CLS :END
530 IF L<1 OR L>4 THEN 410
540 REM
                    ENTER PARAMETERS FOR SUBSIDENCE CALCULATION
550 REM             CHECK FOR PARAMETER LIMITATIONS (SUBDOC84)
560 REM
570 COLOR 2,0,8 : CLS
580 A$="CBDC"
590 LOCATE 2,10:LINE INPUT"Colliery.....";B$
600 LOCATE 3,10:LINE INPUT"Seam.....";C$
610 LOCATE 4,10:LINE INPUT"Dist/Panel....";D$
620 CLS
630 LOCATE 6,10: INPUT"Panel Width.....";A
640 LOCATE 7,10 : INPUT "Seam Thickness..";B
650 LOCATE 8,10: INPUT"Panel Length....";C
660 LOCATE 9,10: INPUT"Depth (meters)..";D:PRINT
670 REM

        CHECK TO SEE IF SUBSIDENCE DEVELOPED
680 IF D*1.4 > C THEN CLS:LOCATE 5,20: PRINT "THE MAXIMUM SUBSIDENCE HAS NOT YET
":LOCATE 7,20: PRINT "BEEN DEVELOPED, PLEASE REFER TO THE" :LOCATE 9,20: PRINT "
MCB SUBSIDENCE ENGINEERS HANDBOOK" : GOTO 690 ELSE GOTO 700
690 ZZ$=INKEY$ : IF ZZ$="" THEN 690 ELSE 220
700 IF D>750 OR D<10 THEN LOCATE 10,10 :PRINT"Out of bounds DEPTH value":FOR I =
 1 TO 4000:NEXT I:LOCATE 10,10 : PRINT SPC(30): GOTO 660
710 IF A<10 OR A>400 THEN 750
720 IF A/D >14 THEN 770 ELSE IF A/D < .2 THEN 770 ELSE 800
730 REM
```

```
          WIDTH ERROR MESSAGES
740 REM
750 PRINT" Out of bounds width value"
760 FOR I = 1 TO 3500 : NEXT: GOTO 620
770 CLS
780 PRINT" Out of bounds width to height ratio" : FOR I = 1 TO 3500 : NEXT
790 GOTO 620
800 CLS
810 LOCATE 10,5 : INPUT "Do you want to enter seam gradient value ";GRAD$
820 IF LEFT$(GRAD$,1)="y" OR LEFT$(GRAD$,1)="Y" THEN GRAD$="G" ELSE GOTO 840:LOC
ATE 5,5:INPUT"Enter seam gradient value ";GRAD :GRAD$="G": GOTO 920
830 IF LEFT$(GRAD$,1)="G" THEN PRINT :LOCATE 12,5:INPUT"Enter seam gradient valu
e ";GRAD :GRAD$="G": GOTO 920
840 LOCATE 6,10
850 REM

         PROMPT FOR SEAM ELEVATION
860 REM
870 INPUT "Bottom level (MAINGATE) elevation..... ";P
880 V=P
890 LOCATE 7,10
900 INPUT "Top level (TAILGATE) elevation..... ";P1
910 IF P1 > P THEN 800
920 RETURN
930 REM

          SUBSIDENCE SEARCHING PROCESS
940 REM
950 CLS: LOCATE 2,10 :PRINT"Searching, Please Wait....."
960 GOSUB 3030:   REM       Search for maxium sub factor
970 B=B*S:        REM       Calculates maxium subsidence
980 K=G/D*1000 :  REM       Calculates subsidence
990 E=A/D:        REM       Calculates w/h factor for data search
1000 REM
1010 REM    ************************************************************
1020 REM    **  This section holds information for data files    **
1030 REM    **  and retrieves the required data lines from the   **
1040 REM    **  files. Data2 to Data4 files first coluan contain **
1050 REM    **  w/h values. Data5 and Data6 coluan 1 contain the **
1060 REM    **  depth values for the search. M= no. of columns in**
1070 REM    **  file. E is search item. Subscripts A(1) to F(1)  **
1080 REM    **  represent the number nearest the E arguent for   **
1090 REM    **  col 1 searc
```

```
                    h in each file. The adjacent numbers  **
1100 REM    **  in the row are stored in the A and F arrays.     **
1110 REM    ************************************************************
1120 REM
1130 M = 14 : H$="D:DATA2" : GOSUB 3360
1140 GET #1,T% : FOR N = 1 TO M : A(N) = CVS(F$(N)) : NEXT : CLOSE
1150 M = 3 : H$="D:DATA3" : GOSUB 3360
1160 GET #1,T% : FOR N = 1 TO M : C(N) = CVS(F$(N)) : NEXT : CLOSE
1170 M = 19 : H$="D:DATA4" : GOSUB 3360
1180 GET #1,T% : FOR N = 1 TO M : B(N) = CVS(F$(N)) : NEXT : CLOSE
1190 E = D : M = 12 : H$="D:DATA5" : GOSUB 3360
1200 GET #1,T% : FOR N = 1 TO M : D(N) = CVS(F$(N)) : NEXT : CLOSE
1210 E = D : M = 16 : H$="D:DATA6" : GOSUB 3360
1220 GET #1,T% : FOR N = 1 TO M : E(N) = CVS(F$(N)) : NEXT : CLOSE
1230 P=V
1240 IF GRAD$="G" THEN E=GRAD : GOTO 1270
1250 IF P=PI THEN E=A ELSE E=A/(P-PI)
1260 GRAD=E
1270 M = 3 : H$="D:DATA7" : GOSUB 3360
1280 CLOSE : OPEN H$ AS #1 :FIELD #1, 7 AS F$(1), 7 AS F$(2), 7 AS F$(3)
1290 GET #1,T% : FOR N = 1 TO M : F(N) = CVS(F$(N)) : NEXT : CLOSE
1300 RETURN
1310 REM
1320 REM

        PRINTS INFO FOR HARDCOPY
1330 REM
1340 REM
1350 E = A/D                    : REM       SET ORIGINAL w/h FOR HARD COPY
1360 LPRINT CHR$(27);CHR$(64);: REM       REINITIALIZE PRINTER
1370 WIDTH "LPT1:",165          :REM       SET PRINTER WIDTH
1380 REM

         SET PRINT SIZE
1390 REM
1400 LPRINT CHR$(27);"M";CHR$(27);"M1"
1410 LPRINT "       N.C.B. SUBSIDENCE ENGINEERS HANDBOOK   "
1420 LPRINT "              SUBSIDENCE CALCULATIONS         "
1430 LPRINT CHR$(27)"M0";CHR$(27);"E"
1440 LPRINT CHR$(27);CHR$(140);CHR$(15);
1450 REM
          2170 AND 2180 TOGGLES UNDERLINE MODE
1460 REM
1470 LPRINT
1480 GOSUB 3000:LPRINT TAB(1);"A
```

```
                              REA";:GOSUB 3010: LPRINT " ";A$;
1490 LPRINT TAB(40);:GOSUB 3000:LPRINT "COLLIERY";:GOSUB 3010 : LPRINT " ";B$;
1500 LPRINT TAB(80);:GOSUB 3000:LPRINT "SEAM";:GOSUB 3010 : LPRINT " ";C$;
1510 LPRINT TAB(120);:GOSUB 3000:LPRINT "DISTRICT/PANEL";:GOSUB 3010 : LPRINT "
";D$
1520 LPRINT
1530 LPRINT TAB(1);:GOSUB 3000:LPRINT "PANEL WIDTH";:GOSUB 3010 : LPRINT " (m) "
;: LPRINT USING "####.##";A;
1540 LPRINT TAB(60);:GOSUB 3000:LPRINT "SEAM THICKNESS";:GOSUB 3010 : LPRINT " (
m) ";:LPRINT USING "###.##";B;
1550 LPRINT TAB(110);:GOSUB 3000:LPRINT "PANEL LENGTH";:GOSUB 3010 : LPRINT " (m
) ";:LPRINT USING "#####.##";C
1560 GOSUB 3000 : LPRINT TAB(1);"PANEL DEPTH";: GOSUB 3010 :LPRINT  " (m) ";:LPR
INT USING "####.##";D;
1570 LPRINT TAB(60);"w/h ratio = ";:LPRINT USING "#.##";E;:LPRINT TAB(96);"S/m =
 ";:LPRINT USING "##.##";S
1580 LPRINT
1590 LPRINT TAB(96);".:. S =";:LPRINT USING "#.##";G
1600 REM
1610 REM

            CALCULATION AND HARDCOPY FOR TRAVERSE SUBSIDENCE
1620 REM
1630 REM
1640 GOSUB 3000 : LPRINT TAB(150);""
1650 LPRINT TAB(1);"¦";" Subsidence as s/S";TAB(25);"¦";
1660 LPRINT USING"     #.##";0;.05;.1;.2;.3;.4;.5;.6;.7;.8;.9;.95;1;
1670 LPRINT TAB(147);"¦"
1680 LPRINT TAB(1);"¦";" Subsidence in meters";TAB(25);"¦";
1690 REM

         THIS CALCULATES PERCENT TRAVERSE AND PRODUCES HARDCOPY
1700 REM
1710 RESTORE 3360
1720   FOR I = 1 TO 13
1730 READ R: G1=G*R
1740 LPRINT USING"     #.##";G1;
1750 NEXT
1760 LPRINT TAB(147);"¦";
1770 GOSUB 3010
1780 LPRINT TAB(1);"¦";"Distance in meters";TAB(25);"¦   ";TAB(147);"¦";
1790 GOSUB 3000
1800 LPRINT TAB(1);"¦";" from panel center";TAB(25);"¦";
1810 REM
```

```
        CALCULATES DISTANCE TO PANEL CENTER FOR TRAVERSE SUBSIDENCE
1820 REM             AND PRINTS A HARDCOPY OF THE RESULTS
1830 REM
1840 FOR N=2 TO 14
1850 LPRINT USING"  ####.##";A(N)+D;
1860 NEXT
1870 LPRINT TAB(147);"!";
1880 GOSUB 3010
1890 LPRINT TAB(1);"!";"DISTANCE IN TERMS OF";TAB(25);"!";TAB(147);"!";
1900 GOSUB 3000
1910 LPRINT TAB(1);"!";"h from panel center";TAB(25);"!";
1920 FOR N=2 TO 14
1930 LPRINT USING"     #.##";A(N);
1940 NEXT
1950 LPRINT TAB(147);"!"
1960 REM
1970 REM

           MAXIMUM STRAIN VALUE CALCULATION
1980 REM
1990 REM
2000 LPRINT :GOSUB 3010
2010 LPRINT  "MAXIMUM STRAIN FACTORS"
2020 LPRINT
2030 REM

        CALCULATES MAXIMUM STRAIN VALUES AND PRINTS RESULTS
2040 REM
2050 LPRINT TAB(10);"+E =";:LPRINT USING "  .##";C(2);:LPRINT " S/h ";TAB(40);"w
here S/h =";:LPRINT USING " ###.##";K;
2060 LPRINT " mm";TAB(90);"-E =";:LPRINT USING " #.##" ;C(3);:LPRINT "S/h"
2070 LPRINT
2080 LPRINT TAB(10);"   =";:LPRINT USING " ##.##";C(2)+K;:LPRINT " mm/m";TAB(90)
;"   =";:LPRINT USING " ##.##";C(3)+K;:LPRINT " mm/m"
2090 IF P1=0 AND P=0 THEN LPRINT : GOTO 2200
2100 LPRINT
2110 LPRINT "ELEVATION (m)              TOP LEVEL (TAILGATE) = ";P1;
2120 LPRINT "                        BOTTOM LEVEL (MAINGATE) = ";P
2130 LPRINT
2140 IF P-P1=0 THEN 2200 : REM      CHECK FOR INCLINE SEAM CORRECTION
2150 LPRINT
2160 LPRINT "INCLINED SEAM TENSILE STRAIN CORRECTION    ";"GRADIENT= ";USING "##
#.##";GRAD;
2170 LPRINT "
```

```
                                    ";"RISE= ";:LPRINT USING " 000.00";C(2)*F(2)*
K;:LPRINT " mm";
2180 LPRINT "                       ";"DIP= ";:LPRINT USING " 000.00";C(2)*F(3)*K
;:LPRINT " mm"
2190 GOTO 2220
2200 IF GRAD$ ="G" AND GRAD > 0 THEN 2160 ELSE LPRINT "THE SEAM IS ASSUMED TO BE
 FLAT"
2210 REM
2220 LPRINT
2230 REM
              CALCULATES AND PRINTS TRAVERSE STRAIN PROFILE
2240 REM
2250 LPRINT "TRANSVERSE STRAIN PROFILE"
2260 LPRINT
2270 LPRINT TAB(35);"EXTENSION +E";TAB(100);"COMPRESSION -E"
2280 GOSUB 3000:LPRINT TAB(1);" ";TAB(160);" ";:LPRINT :LPRINT TAB(1);"!  e/E";
2290 LPRINT TAB(10);"!";
2300 RESTORE 3550
2310 FOR N= 1 TO 18
2320 READ R:LPRINT USING " 000.00 ";R;
2330 NEXT N
2340 REM

          CALCULATES PERCENT STRAIN AND PRINTS A HARDCOPY
2350 REM
2360 LPRINT TAB(160);"!" ; : GOSUB 3000
2370 LPRINT TAB(1);"!";TAB(10);"!";:RESTORE 3550
2380  FOR N= 1 TO 8 : READ R : LPRINT USING " 000.00 ";R*K*C(2);:NEXT
2390  FOR N= 9 TO 18 : READ R : LPRINT USING " 000.00 ";R*K*C(3);:NEXT:LPRINT TA
B(160);"!";
2400 REM
        CALCULATES AND PRINTS TRAVERSE DISTANCES FOR STRAIN VALUES
2410 REM
2420 LPRINT :LPRINT:LPRINT TAB(1);" ";TAB(160);" " ;: LPRINT TAB(1);"!   h =";
2430 LPRINT TAB(10);"!";:FOR N=2 TO 19 : LPRINT USING "0000.00 ";B(N)*D;: NEXT :
 LPRINT TAB(160);"!";
2440 LPRINT TAB(1);"!   N ";TAB(10);"!";: FOR N = 2 TO 19 : LPRINT USING " 000.0
0 ";B(N);:NEXT
2450 LPRINT TAB(160);"!";: LPRINT
2460 GOSUB 3010
2470 REM

          HEADLINES AND CALCULATIONS FOR TRAVELLING SUBSIDENCE
2480 REM
2490 LPRINT :LPRINT "TR
```

```
                    AVELLING SUBSIDENCE PROFILE"
2500 GOSUB 3000 : LPRINT TAB(1);" ";TAB(160);" ";
2510 LPRINT :LPRINT TAB(1);"! Perpendicular to   !";
2520 REM
2530 REM

        CALCULATES DISTANCES PERPENDICULAR TO FACE CENTER FOR
2540 REM  LONGITUDINAL SUBSIDENCE VALUES AND PRINTS TO HARDCOPY
2550 REM
2560 FOR N = 2 TO 12 : LPRINT USING "   ####.### ";D(N)*D;:NEXT
2570 LPRINT TAB(160);"!"
2580 LPRINT TAB(1);"!  face center m     !";
2590 FOR N = 2 TO 12 : LPRINT USING "    ###.### ";D(N);:NEXT :LPRINT  TAB(160);
"!"
2600 LPRINT
2610 LPRINT TAB(1);" ";TAB(160);" ";:LPRINT TAB(1);"! Subsidence in (m)  !";
2620 REM
2630 REM

        PRINTS HARDCOPY OF PERCENT LONGITUDINAL SUBSIDENCE
2640 REM
2650 RESTORE 3560 : FOR N = 1 TO 11 : READ R : LPRINT USING "    ###.##  ";R;:NE
IT
2660 LPRINT TAB(160);"!";
2670 LPRINT TAB(1);"!";TAB(22);"!";
2680 RESTORE 3560: FOR N = 1 TO 11 : READ R :  LPRINT USING "     ##.##  ";R*G;:
NEXT: LPRINT TAB(160);"!";
2690 REM
2700 REM

        HEADLINES AND CALCULATIONS OF TRAVELLING STRAIN
2710 REM
2720 REM
2730 LPRINT :LPRINT : LPRINT "TRAVELLING STRAIN PROFILE (mm/M)"
2740 LPRINT TAB(1);" ";TAB(160);" ";
2750 LPRINT TAB(1);"! Perpendicular to !";
2760 REM
2770 REM
        CALCULATES DISTANCES PERPENDICULAR TO FACE CENTER FOR LONGITUDAL
2780 REM     STRAIN VALUES AND PRINTS IT TO HARDCOPY
2790 REM
2800 FOR N = 2 TO 16 : L=D*E(N):LPRINT USING " ####.##";L;: NEXT
2810 LPRINT "    NA    NA    NA !";
2820 LPRINT TAB(1);"! To face center m !";
2830 LPRINT " ";:FOR N = 2 TO 16
```

```
                                : LPRINT USING " 000.000";E(N);:NEXT:LPRINT TAB
(160);"!"
2840 LPRINT
2850 LPRINT TAB(1);" ";TAB(160);" ";: RESTORE 3550 : LPRINT TAB(1);"! e/E:";TAB(
20);"!";
2860 FOR N = 1 TO 18 : READ R : LPRINT USING " 000.00";R;:NEXT : LPRINT TAB(160)
;"!";
2870 REM
2880 REM
        CALCULATES AND PRINTS PERCENT LONGITUDINAL STRAIN VALUES
2890 REM
2900 RESTORE 3550 : LPRINT  TAB(1);"!";TAB(20);"!";
2910 FOR N= 2 TO 8 : READ R : L=C(2)*R*K : LPRINT USING " 000.00";L;:NEXT
2920 FOR N= 9 TO 19 : READ R: L=C(3)*R*K : LPRINT USING " 000.00";L;:NEXT:LPRINT
 TAB(160);"!"
2930 LPRINT CHR$(12);
2940 GOSUB 3010
2950 RETURN
2960 END
2970 REM
2980 REM

        TOGGLE PRINTER UNDERLINE MODE
2990 REM
3000 LPRINT CHR$(27)"-1";:RETURN
3010 LPRINT CHR$(27)"-0";:RETURN
3020 REM
3030 REM

        SECTION TO FIND MAXIMUM SUBSIDENCE FACTOR IN DATA1
3040 REM
3050 T%=0: K1=0 :K=0:J=0:RESTORE
3060 K=D/10 : K1=INT(K): IF K-K1 >=.5 THEN 3070 ELSE 3080
3070 K1=K1+1
3080 K1=K1*10
3090 IF D< 50 THEN GOSUB 3620
3100 IF D >= 50 THEN 3110 ELSE 3170
3110  I = 50:X=0 : X1=0  :E=0
3120 WHILE K1>I AND I<=850
3130 X=X+1
3140 I=I+10
3150 WEND
3160 X=X+8
3170 K=A/10 : K1=INT(K): IF K-K1 >=.5 THEN 3180 ELSE 3190
3180 K1=K1+1
```

```
3190 K1=K1*10
3200 J=2
3210 WHILE K1 > X1 AND J<=40
3220 X1=J*10
3230 J=J+1
3240 WEND
3250 H$="D:DATA1"
3260 CLOSE : OPEN H$ AS #1 LEN=10
3270 GOSUB 4750
3280 T% = ((J - 1) * 89) + I
3290 GET #1,T%
3300 S=CVS(F$(1)) :TTT%=T% :JJJ=J :XXX=X
3310 CLOSE : RETURN
3320 REM
3330 REM
         THIS SECTION FINDS THE ADDRESS FOR THE DATA LINE WHICH
3340 REM  MATCHES THE W/H AND DEPTHS FOR ALL DATA TABLE SEARCHES

3350 REM
3360 T%=1: I=0
3370 IF H$="D:DATA4" OR H$="D:DATA5" OR H$="D:DATA6" THEN OPEN H$ AS #1 LEN=135
:OPEN H$ AS #2 LEN=135: GOTO 3400
3380 OPEN H$ AS #1
3390 OPEN H$ AS #2
3400 Y$=RIGHT$(H$,1)
3410 Y=ASC(Y$)-48
3420 ON Y GOSUB 4770,4800,4850,4900,4950,5000,5050
3430 GET #1,T% : Z=CVS(F$(1))
3440 GET #2,T%+1 : Z1=CVS(F$(1))
3450 IF Z = E THEN RETURN ELSE IF Z=11 AND Z1=99 THEN RETURN ELSE IF Z < E AND Z
1 > E THEN 3470  ELSE 3460
3460 T%=T%+1 : GOTO 3430
3470 IF ABS(Z-E) < ABS(Z1-E) THEN 3480 ELSE 3490
3480 RETURN
3490 T%=T%+1 : RETURN
3500 REM
3510 REM

         THE FOLLOWING DATA LINES CALCULATE PERCENTAGES OF MAXIMUM
3520 REM    SUBSIDENCE AND MAXIMUM STRAIN THROUGHOUT THE PROGRAM
3530 REM
3540 DATA 0.0,.05,.10,.20,.30,.40,.50,.60,.70,.80,.90,.95,1.00
3550 DATA 0.0,.2,.4,.6,.8,1,.8,0,.2,.4,.6,.8,1,.8,.6,.4,.2,0
3560 DATA .05,.1,.2,.3,.4,.
```

```
                    5,.6,.7,.8,.9,.95
3570 REM
3580 RETURN
3590 REM
3600 REM

     SEARCHES FOR DEPTHS BETWEEN 10 AND 50 FOR MAXIMUM SUBSIDENCE FACTOR
3610 REM
3620 FOR I = 15 TO 50 STEP 5
3630 I=I+1
3640 IF I>K1 THEN RETURN
3650 NEXT
3660 RETURN
3670 REM

     ---------- CREATES DATA FILES FOR GRAPHICS ----------
3680 REM
       The following section calculates and stores data in four files
3690 REM  for graphical plots.  The plots are percent subsidence VS distance
3700 REM  for traverse & longitudinal profiles.  Percent strain vs distances
3710 REM  for traverse and longitudinal strain profiles.
3720 RESTORE 3540
3730 J=25
3740 FOR N=1 TO 13
3750 READ R:H(N)=-G*R : H(J)=H(N) : J=J-1
3760 NEXT
3770 J=25
3780 FOR N=2 TO 14
3790 H1(N-1)=D*A(N) : H1(J)= -H1(N-1) : J=J-1
3800 NEXT
3810 J=35 : RESTORE 3550
3820 FOR N = 1 TO 8
3830 READ R
3840 H2(N)=C(2)*K*R : H2(J) = H2(N) : J=J-1
3850 NEXT
3860 FOR N=9 TO 18
3870 READ R
3880 H2(N)=-C(3)*K*R : H2(J)= H2(N) : J=J-1
3890 NEXT
3900 J=35
3910 FOR N= 2 TO 19
3920 H3(N-1)=-B(N)*D : H3(J)=B(N)*D : J=J-1
3930 NEXT
3940 RESTORE 3560
3950 FOR N = 1 T
```

```
              D 11
3960 READ R
3970 H4(N)=-G * R
3980 NEXT
3990 FOR N = 2 TO 12
4000 H5(N-1)=D(N)*D
4010 NEXT
4020 RESTORE 3550
4030 FOR N = 1 TO 8
4040 READ R
4050 H6(N)=C(2)*R*K
4060 NEXT
4070 FOR N = 9 TO 16
4080 READ R
4090 H6(N)=-C(3)*R*K
4100 NEXT
4110 FOR N = 2 TO 17
4120 H7(N-1)=D*E(N)
4130 NEXT
4140 REM
4150 REM

       THE FOUR DATA FILES ARE NAMED:  TPL1, TPL2, TPL3, TPL4
4160 REM
4170 CLS
4180 REM

           DATA FILE      TPLT1
4190 REM
4200 FI$="TPLT1": OPEN "O",#1,FI$
4210 PRINT #1,"N.C.B.  SEH K FACTOR  TRANSVERSE SUBSIDENCE VS DISTANCE"
4220 PRINT #1,"SUBSIDENCE"
4230 PRINT #1,"DISTANCE (m)"
4240 GOSUB 5080
4250 FOR N=1 TO 25
4260 PRINT #1,N;USING"#######.###";H1(N);H(N)
4270 NEXT
4280 CLOSE
4290 REM

           DATA FILE      TPLT2
4300 REM
4310 FI$="TPLT2" : OPEN "O",#1,FI$
4320 Q=0 : FL=0
4330 PRINT #1,"N.C.B.  SEH K FACTO
```

```
                                R  STRAIN VS DISTANCE"
4340 PRINT #1,"STRAIN"
4350 PRINT #1,"DISTANCE (m)"
4360 GOSUB 5080
4370 FOR N = 1 TO 35
4380 IF H3(N)=0 AND FL=1 THEN  4410
4390 Q=Q+1
4400 PRINT #1,Q;USING "########.#####";H3(N);H2(N)
4410 IF H3(N)=0 THEN FL=1 ELSE FL=0
4420 NEXT
4430 CLOSE
4440 REM

           DATA FILE      TPLT3
4450 REM
4460 FI$="TPLT3" : OPEN "O",#1,FI$
4470 Q=0
4480 PRINT #1,"N.C.B.  SEH K FACTOR  SUBSIDENCE VS LONGITUDINAL DISTANCE"
4490 PRINT #1,"SUBSIDENCE"
4500 PRINT #1,"DISTANCE (m)"
4510 GOSUB 5080
4520 FOR N=1 TO 11
4530 IF H4(N)=0 THEN 4560
4540 Q=Q+1
4550 PRINT #1,Q;USING "########.###";H5(N);H4(N)
4560 NEXT
4570 CLOSE
4580 Q=0
4590 REM

           DATA FILE      TPLT4
4600 REM
4610 FI$="TPLT4" : OPEN "O",#1,FI$
4620 PRINT #1,"N.C.B.  SEH K FACTOR  STRAIN VS LONGITUDINAL DISTANCE"
4630 PRINT #1,"STRAIN"
4640 PRINT #1,"DISTANCE (m)"
4650 GOSUB 5080
4660 FOR N = 1 TO 15
4670 IF H6(N)=0 THEN 4700
4680 Q=Q+1
4690 PRINT #1,Q;USING "########.#####";H7(N);H6(N)
4700 NEXT
4710 CLOSE
4720 REM
```

```
        CHAIN TO GRAPHIC PROGRAM
4730 REM
4740 CHAIN "SUBGRAF" : REM  GRAPHICS PROGRAM FOR SUBSIDENCE PLOTS
4750 REM

          FILE READER
4760 REM
4770 FIELD #1,7 AS F$(1)
4780 RETURN
4790 REM
4800 FIELD #1,7  AS F$(1), 7  AS F$(2), 7  AS F$(3), 7  AS F$(4), 7  AS F$(5), 7
  AS F$(6), 7  AS F$(7), 7  AS F$(8), 7  AS F$(9), 7  AS F$(10), 7  AS F$(11), 7
  AS F$(12), 7  AS F$(13),  7 AS F$(14)
4810 FIELD #2,7  AS F$(1), 7  AS F$(2), 7  AS F$(3), 7  AS F$(4), 7  AS F$(5), 7
  AS F$(6), 7  AS F$(7), 7  AS F$(8), 7  AS F$(9), 7  AS F$(10), 7  AS F$(11), 7
  AS F$(12), 7  AS F$(13),  7 AS F$(14)
4820 RETURN
4830 REM

          DATA3 FILE OPENER
4840 REM
4850 FIELD #1,7  AS F$(1), 7  AS F$(2), 7  AS F$(3)
4860 FIELD #2,7  AS F$(1), 7  AS F$(2), 7  AS F$(3)
4870 RETURN
4880 REM

          DATA4 FILE OPENER
4890 REM
4900 FIELD #1,7  AS F$(1),7 AS F$(2),7 AS F$(3),7 AS F$(4),7 AS F$(5),7 AS F$(6)
,7 AS F$(7),7 AS F$(8),7 AS F$(9),7 AS F$(10),7 AS F$(11),7 AS F$(12),7 AS F$(13
),7 AS F$(14),7 AS F$(15),7 AS F$(16),7 AS F$(17),7 AS F$(18),7 AS F$(19)
4910 FIELD #2,7  AS F$(1),7 AS F$(2),7 AS F$(3),7 AS F$(4),7 AS F$(5),7 AS F$(6)
,7 AS F$(7),7 AS F$(8),7 AS F$(9),7 AS F$(10),7 AS F$(11),7 AS F$(12),7 AS F$(13
),7 AS F$(14),7 AS F$(15),7 AS F$(16),7 AS F$(17),7 AS F$(18),7 AS F$(19)
4920 RETURN
4930 REM

          DATA5 FILE OPENER
4940 REM
4950 FIELD #1,7  AS F$(1),7 AS F$(2),7 AS F$(3),7 AS F$(4),7 AS F$(5),7 AS F$(6)
,7 AS F$(7),7 AS F$(8),7 AS F$(9),7 AS F$(10),7 AS F$(11),7 AS F$(12)
4960 FIELD #2,7  AS F$(1),7 AS F$(2),7 AS F$(3),7 AS F$(4),7 AS F$(5),7 AS F$(6)
,7 AS F$(7),7 AS F$(8),7 AS F$(9),7 AS F$(10),7 AS F$(11),7 AS F$(12)
4970 RETURN
```

```
4980 REM

                DATA6 FILE OPENER
4990 REM
5000 FIELD #1,7  AS F$(1),7 AS F$(2),7 AS F$(3),7 AS F$(4),7 AS F$(5),7 AS F$(6)
,7 AS F$(7),7 AS F$(8),7 AS F$(9),7 AS F$(10),7 AS F$(11),7 AS F$(12),7 AS F$(13
),7 AS F$(14),7 AS F$(15),7 AS F$(16)
5010 FIELD #2,7  AS F$(1),7 AS F$(2),7 AS F$(3),7 AS F$(4),7 AS F$(5),7 AS F$(6)
,7 AS F$(7),7 AS F$(8),7 AS F$(9),7 AS F$(10),7 AS F$(11),7 AS F$(12),7 AS F$(13
),7 AS F$(14),7 AS F$(15),7 AS F$(16)
5020 RETURN
5030 REM

                DATA7 FILE OPENER
5040 REM
5050 FIELD #1,7  AS F$(1), 7  AS F$(2), 7  AS F$(3)
5060 FIELD #2,7  AS F$(1), 7  AS F$(2), 7  AS F$(3)
5070 RETURN
5080 REM

          COLLIERY DATA FOR GRAPHICS FILES
5090 REM
5100 PRINT #1,B$
5110 PRINT #1,C$
5120 PRINT #1,D$
5130 PRINT #1,A
5140 PRINT #1,B
5150 PRINT #1,C
5160 PRINT #1,D
5170 RETURN
5180 REM

        BATCH ENTRY ROUTINE
5190 REM
5200 CLS:LOCATE 5,5 :INPUT "How many calculations do you wish to perform ";NUM
5210 LOCATE 7,7 :    INPUT "Do you wish to enter the gradient values ";GRAD$
5220 IF LEFT$(GRAD$,1)="y" OR LEFT$(GRAD$,1)="Y" OR LEFT$(GRAD$,1)="n" OR LEFT$(
GRAD$,1)="N" THEN 5230 ELSE 5210
5230 FOR NU = 1 TO NUM
5240 CLS
5250 LOCATE 5 :PRINT "Calculation number ";NU
5260 PRINT:PRINT
5270 INPUT "     Colliery.....";BB$(NU)
```

```
5280 INPUT "     Seam.............";CC$(NU)
5290 INPUT "     District/Panel...";DD$(NU)
5300 INPUT "     Panel Width......";AA(NU)
5310 INPUT "     Seam Thickness...";BB(NU)
5320 INPUT "     Panel Length.....";CC(NU)
5330 INPUT "     Depth............";DD(NU)
5340 IF LEFT$(GRAD$,1)="y" OR LEFT$(GRAD$,1)="Y" OR LEFT$(GRAD$,1)="G" THEN
     INPUT "     Seam gradient....";GRADD(NU):GRAD$="G":GOTO 5370
5350 INPUT "     Lower seam elev..";PP(NU)
5360 INPUT "     Upper seam elev..";PP1(NU)
5370 PRINT
5380 INPUT "     Is everything correct ";COR$
5390 IF COR$="" THEN 5380 ELSE IF LEFT$(COR$,1)="n" OR LEFT$(COR$,1)="N" THEN 52
40
5400 IF DD(NU)*1.4 > CC(NU) THEN CLS:LOCATE 5,20: PRINT "THE MAXIMUM SUBSIDENCE
HAS NOT YET":LOCATE 7,20: PRINT "BEEN DEVELOPED, PLEASE REFER TO THE" :LOCATE 9,
20: PRINT "NCB SUBSIDENCE ENGINEERS HANDBOOK" : GOTO 5410 ELSE GOTO 5420
5410 ZZ$=INKEY$ : IF ZZ$="" THEN 5410 ELSE 5240
5420 REM
                CHECK FOR INCORRECT SEAM ELEVATIONS
5430 REM
5440 IF DD(NU)>750 OR DD(NU)<10 THEN PRINT"Out of bounds DEPTH value":GOTO 5250
5450 IF PP1(NU)>PP(NU) THEN PRINT"Incorrect seam elevations" : GOTO 5250
5460 IF AA(NU)<10 OR AA(NU)>400 THEN PRINT"Out of bounds width value": GOTO 5250

5470 IF AA(NU)/DD(NU) > 14 OR AA(NU)/DD(NU) < .2 THEN PRINT"Out of bounds width
to height ratio":GOTO 5250
5480 NEXT NU
5490 FOR NU=1 TO NUM
5500 B$=BB$(NU):C$=CC$(NU):D$=DD$(NU):A=AA(NU):B=BB(NU):C=CC(NU):D=DD(NU):P=PP(N
U):P1=PP1(NU):GRAD=GRADD(NU)
5510 COLOR 14,0,0 : CLS : LOCATE 10,5 :PRINT "Searching number ";NU;". Please wa
it....."
5520 V=P
5530 GOSUB 960
5540 COLOR 2,0,0 : CLS : LOCATE 10,5 : PRINT "Printing number ";NU;". Please wai
t....."
5550 GOSUB 1320
5560 NEXT NU
5570 COLOR 14,0,0 : CLS
5580 LOCATE 6,5 : PRINT " (R)UN PROGRAM AGAIN"
5590 LOCATE 7,5 : PRINT " (Q)UIT"
5600 LOCATE 9,15 : ANS$=INPUT$(1)
5610 IF ANS$="r" OR ANS$="R"

55610 IF ANS$="r" OR ANS$="R" THEN CHAIN"SUB$4"
5620 IF ANS$="q" OR ANS$="Q" THEN COLOR 7,0,0 : CLS:END ELSE 5570
```

APPENDIX C - GRAPHH.BAS

```
10 REM*************************************************************************
20 REM***                                                                   ***
30 REM***                  SCREEN PLOTTING ROUTINE                          ***
40 REM***                                                                   ***
50 REM***              Written by:     Derrick Zinck                        ***
60 REM***                              February 1986.                       ***
70 REM***                                                                   ***
80 REM***          Department of Energy Mines & Resources                   ***
90 REM***          CANMET/CRL  Cape Breton                                  ***
100 REM**          210 George St.                                           ***
110 REM**          Sydney,   Nova Scotia                                    ***
120 REM**          Canada    B1P 1J3                                        ***
130 REM**                                                                   ***
140 REM*************************************************************************
150 REM

                This Program Works in Conjunction with
160 REM         the Subsidence program to produce plots
170 KEY OFF
180 DIM Y(300),X(300),YY(300),XX(300)
190 SCREEN 0,0,0 :COLOR 3,0,9:CLS:LOCATE 3,35 : PRINT "MAIN  MENU"
200 LOCATE 5,30 : PRINT "1).......PREVIEW GRAPH"
210 LOCATE 6,30 : PRINT "2).......RETURN TO GRAPHICS MENU"
220 LOCATE 7,30 : PRINT "3).......ANOTHER SUBSIDENCE CALCULATION"
230 LOCATE 9,33 : INPUT "Choice ";CH
240 IF CH=1 THEN 260
250 IF CH=2 THEN CHAIN "SUBGRAF.BAS"
260 IF CH=3 THEN CHAIN "SUB#4.BAS" ELSE 190
270 REM
280 GOSUB 1470
290 T$=CHR$(3)
300 XMAX=-999999! :XMIN=999999! :YMAX=-999999! :YMIN=999999!
310 OPEN "I",#1,NA$
320 INPUT #1,TITLE$
330 INPUT #1,YX$
340 INPUT #1,XX$
350 FOR I = 1 TO 3:INPUT #1,COLDAT$(I):NEXT
360 FOR I = 1 TO 4 : INPUT #1,COLDAT(I):NEXT
370 I=0
380 WHILE NOT EOF(1):I=I+1: INPUT #1,A,X(I),Y(I)
390 IF XMIN =0 THEN XMIN=-.00001
400 IF YMIN =0 THEN YMIN=-.00001
410 IF XMAX =0 THEN XMAX= .00001
420 IF YMAX =0 THEN YMAX= .00001
430 IF X(I) < XMIN THEN XMIN = X(I)
440 IF X(I) > XMAX THEN XMAX = X(I)
450 IF Y(I) < YMIN THEN YMIN = Y(I)
460 IF Y(I) > YMAX THEN YMAX = Y(I)
470 WEND
480 J = I
490 FOR I=1 TO J
500 XX(I)= ABS(XMIN)+X(I)
510 YY(I)= ABS(YMIN)+Y(I)
520 NEXT
```

```
530 XMI=XMIN:XMA=XMAX
540 YMI=YMIN:YMA=YMAX
550 XXMI=XMIN:XXMA=XMAX:YYMI=YMIN:YYMA=YMAX
560 X=XMIN : GOSUB 1300 : XMIN=X*Z : ZXMIN=Z
570 XMI=ABS(XMIN)-ABS(XMI)
580 X=XMAX : GOSUB 1300 : XMAX=X*Z : ZXMAX=Z
590 XMA=ABS(XMAX)-ABS(XMA)
600 X=YMIN : GOSUB 1300 : YMIN=X*Z : ZYMIN=Z
610 YMI=ABS(YMIN)-ABS(YMI)
620 X=YMAX : GOSUB 1300 : YMAX=X*Z : ZYMAX=Z
630 YMA=ABS(YMAX)-ABS(YMA)
640 XAX=(ABS(XXMI)+ABS(XXMA))/2
650 X=XAX : GOSUB 1300 : XAX= X :ZXAX=Z
660 YAX=ABS(YYMI)+ABS(YYMA)
670 X=YAX : GOSUB 1300 : YAX=X :ZYAX=Z
680 XAX=XAX*2 : YAX=YAX+1 :IF XMAX > 0 AND XMIN < 0 AND ABS(XMAX)<>ABS(XMIN) THE
N XAX=XAX+1
690 EN=Z
700 T$=CHR$(3)
710 CLS:LOCATE 2,25 :PRINT "SUBSIDENCE GRAPHICS ROUTINE"
720 LOCATE 8,15 : PRINT " Press any key to plot graph"
730 A$=INKEY$: IF A$="" THEN 730 ELSE 740
740 REM
750 CLS: SCREEN 1,0
760 VIEW (0,0)-(319,199),,1
770 WINDOW (0,0)-(500,300)
780 X=75 : Y=50 : Y1=200 : X1=300     : REM x-y axis values
790  XSCALE = ABS((XAX*100/X1))
800  YSCALE = ABS((YAX*100/Y1))
810 REM
820 REM
830 REM
840 REM
850 REM
860 P=2
870 REM

          Draw Axis
880 LINE (X,Y+Y1)-(X,Y),2
890 LINE (X,Y)-(X+X1,Y),2
900 LINE (X+X1,Y)-(X+X1,Y+Y1),2
910 LINE (X+X1,Y+Y1)-(X,Y+Y1),2
920 REM
930 REM
940 REM
950 FOR XL=0 TO XSCALE * X1 STEP 100
960 LINE (X+XL/XSCALE,Y)-(X+XL/XSCALE,Y-5),2
970 NEXT
980 FOR YL=0 TO YSCALE * Y1 STEP 100
990 LINE (X,Y+YL/YSCALE)-(X-5,Y+YL/YSCALE),2
1000 NEXT
1010 REM

         DATA LINES
```

```
1020 REM
1030 PX=(X+(((XX(1)+XMI)/ZXAX)*100)/XSCALE) :PY=(Y+(((YY(1)+YMI)/ZYAX)*100)/YSCA
LE)
1040 PX1=PX : PY1=PY
1050 FOR I=2 TO J
1060 PX=(X+(((XX(I)+XMI)/ZXAX)*100)/XSCALE) :PY=(Y+(((YY(I)+YMI)/ZYAX)*100)/YSCA
LE)
1070 LINE (PX1,PY1)-(PX,PY),1:PX1=PX : PY1=PY
1080 NEXT
1090 REM
1100 REM

             Label Axis
1110 REM
1120 REM
1130 W=CINT((39-LEN(TITLE$))/2)
1140 LOCATE 2,W:PRINT TITLE$
1150 REM

        XAXIS TITLE
1160 LOCATE 24,15 : PRINT XX$;
1170 REM

        YAXIS TITLE
1180 FOR I = 1 TO LEN(YX$)
1190 LOCATE 6+I,3
1200 Y$ =  MID$ (YX$,I,1)
1210 PRINT Y$
1220 NEXT
1230 LOCATE 7+I,2
1240 IF NA$="TPLT1" OR NA$="TPLT3" THEN PRINT "(a)" ELSE PRINT "(c=)"
1250 LOCATE 23,5 :PRINT XMIN : LOCATE 23,29 : PRINT ZXAX*XAX+XMIN
1260 LOCATE 5,1:PRINT USING"##.#";YAX*ZYAX+YMIN :LOCATE 21,1:PRINT USING"##.#";
YMIN
1270 GOSUB 1600
1280 CLOSE
1290 GOTO 190
1300 REM

        CONVERT X TO INTEGER BETWEEN 1 AND 10
1310 REM  THE RETURNED Z VALUE IS THE VALUE THAT
1320 REM  X MUST BE MULTIPLIED BY TO GET TO THE
1330 REM  PROPER DECIMAL VALUE.
1340 REM
1350 Z=.00001
1360 WHILE Z<1
1370  IF ABS(X) >= Z AND ABS(X) <= (Z*10)-Z THEN IF X<0 THEN X=CINT ((X/Z)-.5) :
RETURN ELSE X=CINT((X/Z)+.5) : RETURN
1380 IF ABS(X) >=.9 AND ABS(X) < 1 THEN  IF X<0 THEN X=CINT(X/.1)-.5 : Z=.1: RET
URN ELSE Z=.1 : X=CINT(X/.1)+.5: RETURN
1390 Z=Z*10:GOTO 1360
1400 WEND
1410 Z=1
1420 WHILE Z<10000
```

```
1430  IF ABS(X) >= Z AND ABS(X) <= (Z*10)-1 THEN IF X<0 THEN X=CINT ((X/Z)-.5) :
RETURN ELSE X=CINT((X/Z)+.5) : RETURN
1440 Z=Z*10 :GOTO 1420
1450 WEND
1460 RETURN
1470 REM

        Graph plotting Menu
1480 CLS
1490 LOCATE 5,35: PRINT"GRAPH  MENU"
1500 LOCATE 7,30:PRINT "1).......Subsidence vs Distance"
1510 LOCATE 8,30:PRINT "2).......Strain vs Distance"
1520 LOCATE 9,30:PRINT "3).......Subsidence vs Longitudinal distance"
1530 LOCATE 10,30:PRINT "4).......Strain vs longitudinal distance"
1540 LOCATE 12,35:INPUT "Choice ";CH
1550 IF CH=1 THEN NA$="TPLT1":RETURN
1560 IF CH=2 THEN NA$="TPLT2":RETURN
1570 IF CH=3 THEN NA$="TPLT3":RETURN
1580 IF CH=4 THEN NA$="TPLT4" :RETURN ELSE 1480
1590 DATA COLLIERY,SEAM,PANEL,WIDTH,THICKNESS,LENGTH,DEPTH
1600 A$=INKEY$: IF A$="" THEN 1600
1610 SCREEN 2
1620 RETURN
```

APPENDIX D - SUBGRAF.BAS

```
10 REM*************************************************************************
20 REM***                                                                   ***
30 REM***                  TAXAN  PLOTTER  ROUTINE                          ***
40 REM***                                                                   ***
50 REM***             Written by:     Derrick Zinck                         ***
60 REM***                             February 1986.                        ***
70 REM***                                                                   ***
80 REM***          Department of Energy Mines & Resources                   ***
90 REM***          CANMET/CRL  Cape Breton                                  ***
100 REM**          210 George St.                                           ***
110 REM**          Sydney,   Nova Scotia                                    ***
120 REM**          Canada    B1P 1J3                                        ***
130 REM**                                                                   ***
140 REM*************************************************************************
150 REM

                This Program Works in Conjunction with
160 REM         the Subsidence program to produce plots
170 REM         on the Taxan 710 x-y plotter.
180 KEY OFF
190 DIM Y(300),X(300),YY(300),XX(300)
200 CLS:LOCATE 3,35 : PRINT "GRAPHICS MENU"
210 LOCATE 5,30 : PRINT "1).......PLOT GRAPH ON PLOTTER"
220 LOCATE 6,30 : PRINT "2).......SUBSIDENCE CALCULATION"
230 LOCATE 7,30 : PRINT "3).......PREVIEW GRAPH"
240 LOCATE 8,30 : PRINT "4).......QUIT"
250 LOCATE 10,33 : INPUT "Choice ";CH
260 IF CH=1 THEN 310
270 IF CH=2 THEN CHAIN "SUB#4"
280 IF CH=3 THEN CHAIN "GRAPHH.BAS"
290 IF CH=4 THEN SCREEN 2:SCREEN 0,0,0:CLS:END ELSE 200
300 REM
310 GOSUB 1700
320 T$=CHR$(3)
330 XMAX=-999999! :XMIN=999999. :YMAX=-999999! :YMIN=999999!
340 OPEN "I",#1,NA$
350 INPUT #1,TITLE$
360 INPUT #1,Y$
370 INPUT #1,XX$
380 FOR I = 1 TO 3:INPUT #1,COLDAT$(I):NEXT
390 FOR I = 1 TO 4 : INPUT #1,COLDAT(I):NEXT
400 I=0
410 WHILE NOT EOF(1):I=I+1: INPUT #1,A,X(I),Y(I)
420 IF XMIN =0 THEN XMIN=-.00001
430 IF YMIN =0 THEN YMIN=-.00001
440 IF XMAX =0 THEN XMAX= .00001
450 IF YMAX =0 THEN YMAX= .00001
460 IF X(I) < XMIN THEN XMIN = X(I)
470 IF X(I) > XMAX THEN XMAX = X(I)
480 IF Y(I) < YMIN THEN YMIN = Y(I)
490 IF Y(I) > YMAX THEN YMAX = Y(I)
500 WEND
510 J = I
520 FOR I=1 TO J
```

```
530 XX(I)= ABS(XMIN)+X(I)
540 YY(I)= ABS(YMIN)+Y(I)
550 NEXT
560 XMI=XMIN:XMA=XMAX
570 YMI=YMIN:YMA=YMAX
580 XXMI=XMIN : XXMA=XMAX : YYMI=YMIN : YYMA=YMAX
590 X=XMIN : GOSUB 1530 : XMIN=X*Z : ZXMIN=Z
600 XMI=ABS(XMIN)-ABS(XMI)
610 X=XMAX : GOSUB 1530 : XMAX=X*Z : ZXMAX=Z
620 XMA=ABS(XMAX)-ABS(XMA)
630 X=YMIN : GOSUB 1530 : YMIN=X*Z : ZYMIN=Z
640 YMI=ABS(YMIN)-ABS(YMI)
650 X=YMAX : GOSUB 1530 : YMAX=X*Z : ZYMAX=Z
660 YMA=ABS(YMAX)-ABS(YMA)
670  CLOSE : OPEN "COM1:300,N,8,1,CS,DS" AS #1
680 XAX=(ABS(XXMI)+ABS(XXMA))/2
690 X=XAX : GOSUB 1530 : XAX=X :ZXAX=Z
700 YAX=ABS(YYMI)+ABS(YYMA)
710 X=YAX : GOSUB 1530 : YAX=X :ZYAX=Z
720 XAX=XAX*2:YAX=YAX+1:IF XMAX>0 AND XMIN<0 AND ABS(XMAX)<>ABS(XMIN) THEN XAX=X
AX+1
730 EN=Z
740 T$=CHR$(3)
750 CLS:LOCATE 2,25 :PRINT "TAXAN PLOTTER ROUTINE"
760 LOCATE 8,5:PRINT"       Insert paper into plotter and press any key to start
 plot."
770 A$=INKEY$: IF A$="" THEN 770 ELSE 780
780 REM
790 CLS: LOCATE 13,20:PRINT" Plotting in progress. Please wait....."
800 REM

.
810 X=75 : Y=50 : Y1=182.0169 : X1=293.8053     : REM x-y axis values
820  XSCALE = ABS((XAX*100)/X1)
830  YSCALE = ABS((YAX*100)/Y1)
840 ON COM(1) GOSUB 1830
850 PRINT #1,CHR$(27)".N";;19:
860 PRINT #1,CHR$(27)".I";;17:
870 PRINT #1,"sp" 1;
880 PRINT #1,"IN";
890 PRINT #1,"SC 0,608,0,400";
900 PRINT #1,"CS" 0;
910 PRINT #1,"SS";
920 P=2
930 REM

          Draw Axis
940 PRINT #1,"pa" X;Y+Y1;
950 PRINT #1,"pd" X;Y+Y1;
960 PRINT #1,"pd" X;Y;
970 PRINT #1,"pd" X+X1;Y;
980 PRINT #1,"PD" X+X1;Y+Y1;
990 PRINT #1,"PD" X;Y+Y1;
1000 PRINT #1,"pu";
```

```
1010 FOR XL=0 TO XSCALE * X1 STEP 100
1020 PRINT #1,"PA" X+XL/XSCALE;Y;: PRINT #1,"PD" X+XL/XSCALE;Y-5;:PRINT #1,"PU";

1030 NEXT
1040 FOR YL=0 TO YSCALE * Y1 STEP 100
1050 PRINT #1,"PA" X;(Y+YL/YSCALE);: PRINT #1,"PD" X-5;(Y+YL/YSCALE);: PRINT #1,
"PU";
1060 NEXT
1070 REM

          DATA LINES
1080 PRINT #1,"SP" 2;
1090 PX=(X+(((XX(1)+XMI)/ZXAX)*100)/XSCALE) :PY=(Y+(((YY(1)+YMI)/ZYAX)*100)/YSCA
LE)
1100 PRINT #1,"pa" PX;PY;
1110 FOR I=2 TO J
1120 PX=(X+(((XX(I)+XMI)/ZXAX)*100)/XSCALE) :PY=(Y+(((YY(I)+YMI)/ZYAX)*100)/YSCA
LE)
1130 PRINT #1,"pd" PX;PY;
1140 NEXT
1150 PRINT #1,"pu";
1160 REM

               Label Axis
1170 PRINT #1,"SP" 3;
1180 PRINT #1,"pa" 175,260;
1190 PRINT #1,"LB" TITLE$;T$;
1200 PRINT #1,"SR" .5,.75;
1210 RESTORE
1220 FOR I = 1 TO 7 : READ Q$:PRINT #1,"PA" I*50;245; "LB" Q$;T$;:NEXT
1230 FOR I = 1 TO 3 : PRINT #1,"PA" I*50;240 ;"LB" COLDAT$(I);T$;:NEXT
1240 FOR I = 1 TO 4 : PRINT #1,"PA" 150+(I*50);240; "LB" COLDAT(I) "(m/";T$;:NEX
T
1250 PRINT #1,"pa" 0;20;: PRINT #1,"LB" DATE$;T$;"PU";
1260 REM

          XAXIS TITLE
1270 PRINT #1,"SR" 1,2;
1280 PRINT #1,"PA" X+120;Y-35;:PRINT #1,"LB" XA$;T$ ;"PU";
1290 REM

          YAXIS TITLE
1300 FOR I = 1 TO LEN(YX$)
1310 PRINT #1,"PA" X-60;Y+Y1-20-I*10;
1320 Y$ =  MID$ (YX$,I,1)
1330 PRINT #1,"LB" Y$;T$;
1340 NEXT
1350 PRINT #1,"PA"X-67;Y+Y1-20-(I+1)*10;
1360 IF NA$="TPLT1" OR NA$="TPLT3" THEN PRINT #1,"LB" "(m/";T$; ELSE PRINT #1, L
B" "(mm)";T$;
1370 PRINT #1,"SP" 1 ;
1380 PRINT #1,"SR" .5,.75;
1390 FOR I=0 TO XSCALE * X1 STEP 100
1400 XCOOR = XMIN+((I*ZXAX)/100)
```

```
1410 IF CINT(ZXAX*10)=1 THEN XCOOR=CINT(XCOOR*10)/10
1420 PRINT #1,"PA" X-5+I/XSCALE;Y-20;:PRINT #1,"LB" XCOOR;T$;
1430 NEXT
1440 FOR I=0 TO YSCALE * Y1 STEP 100
1450 YCOOR = YMIN+((I*ZYAX)/100)
1460 IF CINT(ZYAX*10)=1 THEN YCOOR=CINT(YCOOR*10)/10
1470 IF CINT(ZYAX)=1 THEN YCOOR=CINT(YCOOR*1)
1480 PRINT #1,"PA" X-30;Y+I/YSCALE;: PRINT #1,"LB" YCOOR;T$;
1490 NEXT
1500 PRINT #1,"PA" X+X1+50;0;
1510 PRINT #1,"DF";
1520 CLOSE: GOTO 200
1530 REM

        CONVERT X TO INTEGER BETWEEN 1 AND 10
1540 REM  THE RETURNED Z VALUE IS THE VALUE THAT
1550 REM  X MUST BE MULTIPLIED BY TO GET TO THE
1560 REM  PROPER DECIMAL VALUE.
1570 REM
1580 Z=.00001
1590 WHILE Z<1
1600  IF ABS(X) >= Z AND ABS(X) <= (Z*10)-Z THEN IF X<0 THEN X=CINT ((X/Z)-.5) :
RETURN ELSE X=CINT((X/Z)+.5) : RETURN
1610 IF ABS(X) >=.9 AND ABS(X) < 1 THEN  IF X<0 THEN X=CINT(X/.1)-.5 : Z=.1: RET
URN ELSE Z=.1 : X=CINT(X/.1)+.5: RETURN
1620 Z=Z*10:GOTO 1590
1630 WEND
1640 Z=1
1650 WHILE Z<10000
1660  IF ABS(X) >= Z AND ABS(X) <= (Z*10)-1 THEN IF X<0 THEN X=CINT ((X/Z)-.5) :
RETURN ELSE X=CINT((X/Z)+.5) : RETURN
1670 Z=Z*10 :GOTO 1650
1680 WEND
1690 RETURN
1700 REM

        Graph plotting Menu
1710 CLS
1720 LOCATE 5,33: PRINT"GRAPH  MENU"
1730 LOCATE 7,30:PRINT "1).....Subsidence vs Distance"
1740 LOCATE 8,30:PRINT "2).....Strain vs Distance"
1750 LOCATE 9,30:PRINT "3).....Subsidence vs Longitudinal distance"
1760 LOCATE 10,30:PRINT "4).....Strain vs longitudinal distance"
1770 LOCATE 12,35:INPUT "Choice ";CH
1780 IF CH=1 THEN NA$="TPLT1":RETURN
1790 IF CH=2 THEN NA$="TPLT2":RETURN
1800 IF CH=3 THEN NA$="TPLT3":RETURN
1810 IF CH=4 THEN NA$="TPLT4" :RETURN ELSE 1710
1820 DATA COLLIERY,SEAM,PANEL,WIDTH,THICKNESS,LENGTH,DEPTH
1830 REM
```

APPENDIX E

DATA 1 - Maximum subsidence factors (s/m)

File: Data1 'Number 1 of 7'

1 .68 .45 .10 .05 .05 .04 .03 .02 .02 .02 .02 .02 .02 .02 .02 .02 .02
.02 .02 .02 .02 .02 .02 .02 .02 .02 .02 .02 .02 .02 .02 .02 .02 .02
.02 .02 .02 .02 .02 .02 .02 .02 .02 .02 .02 .02 .02 .02 .02 .02 .02
.02 .02 .02 .02 .02 .02 .02 .02 .02 .02 .02 .02 .02 .02 .02 .02 .02
.02 .02 .02 .02 .02 .02 .02 .02 .02 .02 .02 .02 .02 .02 .02 .02 .02

2 .85 .80 .75 .65 .55 .35 .25 .20 .10 .08 .05 .04 .03 .03 .03 .02 .02 .02
.02 .02 .02 .02 .02 .02 .02 .02 .02 .02 .02 .02 .02 .02 .02 .02 .02 .02
.02 .02 .02 .02 .02 .02 .02 .02 .02 .02 .02 .02 .02 .02 .02 .02 .02 .02
.02 .02 .02 .02 .02 .02 .02 .02 .02 .02 .02 .02 .02 .02 .02 .02 .02 .02
.02 .02 .02 .02 .02 .02 .02 .02 .02 .02 .02 .02 .02 .02 .02 .02 .02

3 .89 .85 .82 .80 .76 .70 .60 .45 .40 .25 .15 .13 .10 .06 .05 .04 .04 .03
.03 .03 .03 .03 .03 .03 .03 .03 .03 .03 .03 .03 .03 .03 .03 .03 .03 .03
.03 .03 .03 .03 .03 .03 .03 .03 .03 .03 .02 .02 .02 .02 .02 .02 .02 .02
.02 .02 .02 .02 .02 .02 .02 .02 .02 .02 .02 .02 .02 .02 .02 .02 .02 .02
.02 .02 .02 .02 .02 .02 .02 .02 .02 .02 .02 .02 .02 .02 .02 .02 .02

4 .90 .88 .86 .85 .84 .80 .77 .70 .65 .50 .40 .35 .25 .20 .20 .15 .10 .10
.07 .07 .06 .05 .05 .04 .05 .05 .04 .04 .04 .04 .04 .04 .04 .04 .04 .04
.04 .04 .04 .04 .04 .04 .04 .03 .03 .03 .03 .03 .03 .03 .03 .03 .03 .03
.03 .03 .03 .03 .03 .03 .03 .03 .03 .03 .03 .03 .03 .03 .03 .03 .03 .03
.03 .03 .02 .02 .02 .02 .02 .02 .02 .02 .02 .02 .02 .02 .02 .02 .02

5 .91 .87 .87 .86 .86 .83 .80 .77 .74 .65 .55 .47 .39 .33 .26 .25 .20 .15
.15 .13 .11 .10 .09 .07 .08 .07 .06 .05 .05 .05 .05 .05 .05 .05 .05 .05
.05 .05 .05 .05 .04 .04 .04 .04 .04 .04 .04 .04 .04 .04 .04 .04 .04 .04
.04 .04 .04 .04 .04 .04 .04 .04 .04 .03 .03 .03 .03 .03 .03 .03 .03 .03
.03 .03 .03 .03 .03 .03 .03 .03 .03 .03 .03 .03 .03 .03 .03 .03 .03

6 .91 .90 .88 .87 .86 .86 .83 .80 .77 .71 .64 .57 .51 .42 .37 .32 .28 .23
.22 .20 .18 .15 .14 .13 .11 .10 .10 .09 .08 .08 .08 .07 .07 .07 .06 .06
.06 .06 .05 .05 .05 .05 .05 .05 .05 .05 .05 .05 .05 .05 .05 .05 .05 .05
.04 .04 .04 .04 .04 .04 .04 .04 .04 .04 .04 .04 .04 .04 .04 .04 .04 .04
.04 .03 .03 .03 .03 .03 .03 .03 .03 .03 .03 .03 .03 .03 .03 .03 .03

7 .91 .90 .89 .88 .87 .87 .85 .84 .80 .77 .71 .67 .61 .55 .49 .45 .38 .35
.30 .27 .26 .24 .20 .18 .17 .16 .15 .13 .12 .12 .11 .10 .10 .09 .07 .09
.08 .08 .08 .08 .08 .08 .07 .07 .07 .07 .07 .07 .07 .07 .06 .05 .05 .05
.05 .05 .05 .05 .05 .05 .05 .05 .05 .05 .05 .05 .05 .05 .04 .04 .04 .04
.04 .04 .04 .04 .04 .04 .04 .04 .04 .04 .04 .04 .04 .04 .04 .04 .04

8 .91 .91 .90 .89 .88 .86 .86 .86 .84 .81 .77 .74 .70 .64 .58 .55 .50 .45
.40 .38 .36 .32 .30 .28 .25 .24 .22 .20 .19 .18 .16 .15 .15 .14 .14 .13
.13 .13 .12 .12 .12 .11 .11 .10 .10 .10 .10 .10 .10 .10 .10 .10 .08 .08
.08 .08 .07 .07 .07 .07 .06 .06 .06 .06 .06 .06 .05 .05 .05 .05 .05 .05
.05 .05 .05 .05 .05 .05 .05 .05 .05 .05 .05 .05 .05 .04 .04 .04 .04

9 .91 .91 .90 .89 .89 .88 .87 .86 .85 .83 .80 .77 .74 .70 .65 .60 .56 .53
.50 .46 .45 .40 .37 .35 .32 .30 .28 .25 .24 .23 .21 .20 .19 .18 .18 .17
.17 .16 .15 .15 .15 .15 .14 .14 .14 .13 .13 .12 .12 .12 .11 .11 .10 .10
.10 .09 .09 .08 .08 .08 .08 .08 .07 .07 .07 .07 .07 .07 .07 .06 .06 .06
.06 .06 .06 .06 .06 .05 .05 .05 .05 .05 .05 .05 .05 .05 .05 .05 .05

10 .91 .91 .90 .90 .90 .89 .88 .87 .86 .84 .81 .80 .77 .73 .70 .65 .62 .59
.55 .53 .50 .47 .45 .42 .40 .38 .35 .32 .30 .28 .27 .25 .25 .24 .23 .22
.21 .21 .20 .20 .19 .18 .18 .17 .16 .16 .15 .15 .15 .15 .14 .14 .12 .12
.12 .11 .11 .10 .10 .10 .09 .09 .09 .09 .08 .08 .08 .08 .08 .07 .07 .07
.07 .07 .07 .06 .06 .06 .06 .06 .06 .06 .06 .06 .06 .06 .06 .06 .06

11 .91 .91 .90 .90 .90 .89 .88 .87 .86 .84 .81 .80 .77 .73 .70 .65 .62 .59
.55 .53 .50 .47 .45 .42 .40 .38 .35 .32 .30 .28 .27 .25 .25 .24 .23 .22
.21 .21 .20 .20 .20 .22 .21 .20 .20 .19 .18 .18 .17 .17 .16 .16 .15 .14
.13 .13 .12 .12 .12 .12 .11 .10 .10 .10 .09 .09 .09 .09 .09 .08 .08 .08
.08 .08 .08 .07 .07 .07 .07 .07 .07 .07 .07 .07 .07 .07 .07 .07 .07

12 .91 .91 .91 .90 .90 .88 .87 .87 .87 .86 .85 .83 .81 .79 .76 .74 .70 .67
.63 .60 .61 .58 .55 .55 .51 .50 .47 .44 .41 .40 .38 .35 .35 .38 .32 .30
.30 .28 .27 .26 .25 .25 .24 .23 .23 .22 .21 .20 .20 .19 .18 .18 .16 .16
.15 .15 .14 .13 .13 .13 .12 .11 .11 .11 .10 .10 .10 .10 .10 .09 .09 .09
.09 .09 .09 .08 .08 .08 .08 .08 .08 .08 .08 .07 .07 .07 .07 .07 .07

13 .92 .91 .91 .90 .90 .89 .87 .87 .87 .87 .86 .85 .83 .81 .80 .77 .75 .73
.70 .68 .66 .65 .62 .60 .58 .56 .55 .51 .50 .47 .45 .43 .40 .40 .38 .36
.35 .33 .32 .31 .30 .29 .28 .27 .26 .25 .25 .24 .23 .22 .21 .20 .19 .19
.18 .17 .16 .16 .15 .15 .14 .14 .13 .13 .12 .12 .12 .11 .11 .11 .10 .10
.10 .10 .10 .09 .09 .09 .09 .09 .09 .09 .09 .08 .08 .08 .08 .08 .08

14 .92 .91 .91 .90 .90 .90 .88 .88 .88 .87 .86 .86 .85 .83 .81 .80 .78 .76
.75 .72 .70 .69 .66 .65 .63 .61 .60 .57 .55 .53 .50 .48 .46 .45 .44 .41
.40 .38 .36 .35 .34 .33 .32 .30 .30 .29 .28 .27 .25 .25 .24 .23 .22 .21
.20 .19 .19 .18 .17 .17 .16 .15 .15 .15 .14 .13 .13 .13 .12 .12 .11 .11
.11 .11 .11 .11 .10 .10 .10 .10 .10 .10 .10 .09 .09 .09 .09 .09 .09

15 .91 .91 .91 .91 .90 .90 .90 .89 .89 .88 .87 .86 .86 .85 .84 .83 .81 .80
.78 .75 .75 .72 .70 .69 .67 .65 .64 .62 .60 .57 .55 .53 .50 .49 .47 .46
.45 .42 .40 .39 .37 .36 .35 .33 .32 .31 .30 .30 .28 .27 .26 .25 .23 .23
.22 .21 .21 .20 .19 .18 .17 .17 .16 .16 .15 .15 .15 .14 .14 .13 .13 .13
.12 .12 .12 .12 .12 .11 .11 .11 .11 .11 .11 .11 .11 .10 .10 .10 .10

16 .92 .91 .91 .91 .91 .90 .90 .90 .89 .88 .87 .86 .86 .86 .85 .84 .83 .81
.80 .79 .77 .75 .73 .72 .70 .68 .67 .65 .63 .61 .59 .56 .55 .53 .50 .48
.47 .45 .44 .42 .40 .39 .37 .35 .35 .33 .32 .32 .30 .29 .28 .27 .27 .25
.24 .23 .23 .21 .20 .20 .19 .18 .17 .17 .16 .16 .15 .15 .15 .15 .14 .14
.13 .13 .13 .13 .12 .12 .12 .12 .12 .12 .11 .11 .11 .10 .10 .10 .10

17 .92 .92 .91 .91 .91 .91 .91 .90 .90 .89 .88 .87 .87 .86 .86 .85 .85 .84
.82 .81 .80 .78 .76 .75 .74 .72 .73 .66 .70 .65 .62 .60 .58 .56 .55 .52
.50 .48 .46 .45 .43 .42 .40 .39 .37 .35 .35 .34 .32 .31 .30 .30 .29 .26
.26 .25 .24 .23 .22 .21 .21 .20 .19 .19 .18 .17 .17 .16 .16 .16 .15 .15
.14 .14 .14 .14 .13 .13 .13 .13 .13 .13 .12 .12 .12 .11 .11 .11 .11

18 .92 .92 .91 .91 .91 .91 .91 .90 .90 .90 .89 .88 .87 .87 .87 .86 .86 .85
.85 .83 .82 .81 .80 .78 .77 .75 .74 .72 .70 .68 .66 .64 .62 .60 .58 .56
.54 .52 .50 .48 .46 .45 .43 .42 .40 .39 .37 .36 .35 .34 .33 .32 .32 .29
.28 .27 .26 .25 .24 .23 .23 .22 .21 .20 .20 .19 .18 .17 .17 .17 .16 .16
.16 .15 .15 .15 .15 .14 .14 .14 .14 .14 .13 .13 .13 .13 .13 .13 .13

19 .92 .92 .91 .91 .91 .91 .91 .91 .90 .90 .89 .89 .88 .87 .87 .87 .86 .86
.86 .85 .84 .83 .81 .81 .79 .78 .79 .75 .75 .71 .69 .66 .65 .63 .61 .60
.57 .55 .53 .51 .49 .47 .46 .45 .43 .41 .40 .38 .37 .36 .35 .34 .34 .31
.30 .29 .28 .27 .26 .25 .25 .24 .23 .23 .22 .21 .20 .20 .19 .18 .18 .18
.17 .16 .16 .16 .16 .15 .15 .15 .15 .15 .14 .14 .14 .14 .14 .14 .14

20 .92 .92 .91 .91 .91 .91 .91 .91 .91 .90 .90 .90 .89 .88 .88 .88 .87 .87
.87 .86 .85 .85 .83 .83 .82 .81 .78 .78 .75 .74 .73 .70 .68 .66 .63 .64
.61 .58 .56 .55 .53 .50 .49 .47 .45 .43 .42 .41 .40 .38 .37 .37 .36 .34
.33 .32 .31 .30 .29 .28 .27 .26 .25 .25 .24 .23 .22 .21 .21 .20 .20 .19
.18 .18 .17 .17 .17 .17 .17 .16 .16 .16 .16 .16 .16 .15 .15 .15 .15

21 .92 .92 .91 .91 .91 .91 .91 .91 .91 .91 .90 .90 .89 .89 .89 .89 .87 .87
.87 .86 .86 .85 .85 .85 .83 .83 .83 .79 .80 .76 .75 .72 .70 .69 .67 .65
.63 .60 .58 .57 .55 .53 .51 .50 .47 .45 .43 .43 .42 .40 .39 .38 .39 .36
.35 .34 .33 .32 .31 .30 .29 .28 .27 .26 .25 .25 .24 .23 .22 .21 .21 .20
.19 .19 .18 .18 .18 .18 .18 .17 .17 .17 .17 .17 .17 .16 .16 .16 .16

22 .92 .92 .91 .91 .91 .91 .91 .91 .91 .91 .90 .90 .90 .89 .89 .90 .88 .88
.88 .87 .87 .86 .86 .85 .85 .84 .84 .81 .82 .78 .76 .75 .73 .71 .70 .68
.66 .63 .61 .60 .57 .55 .54 .52 .50 .48 .47 .45 .44 .43 .42 .41 .40 .38
.37 .36 .35 .34 .33 .32 .31 .30 .29 .28 .27 .26 .25 .25 .24 .23 .23 .23
.22 .21 .20 .20 .20 .19 .19 .19 .18 .18 .18 .18 .18 .17 .17 .17 .17

23 .92 .92 .92 .92 .91 .91 .91 .91 .91 .91 .91 .91 .90 .90 .90 .90 .89 .89
.88 .87 .87 .86 .86 .86 .85 .85 .85 .83 .83 .80 .78 .76 .75 .73 .72 .70
.68 .65 .63 .61 .60 .57 .56 .55 .52 .50 .49 .48 .47 .45 .44 .43 .42 .40
.39 .38 .37 .36 .35 .34 .33 .32 .31 .30 .30 .28 .27 .26 .26 .25 .25 .24
.23 .23 .22 .21 .21 .20 .20 .20 .19 .19 .19 .19 .19 .18 .18 .18 .18

24 .92 .92 .92 .92 .92 .91 .91 .91 .91 .91 .91 .91 .90 .90 .90 .90 .90 .90
.89 .88 .87 .87 .87 .86 .86 .85 .85 .84 .84 .81 .80 .78 .77 .75 .74 .72
.70 .67 .65 .63 .62 .60 .58 .56 .55 .53 .52 .50 .49 .47 .46 .45 .44 .42
.41 .40 .39 .38 .37 .36 .35 .34 .33 .32 .31 .30 .30 .29 .28 .27 .27 .26
.25 .25 .24 .23 .23 .22 .22 .22 .22 .21 .20 .20 .20 .20 .20 .20 .19

25 .92 .92 .92 .92 .92 .92 .91 .91 .91 .91 .91 .91 .90 .90 .90 .90 .90 .90
.90 .89 .88 .87 .87 .87 .86 .86 .86 .85 .85 .83 .81 .80 .78 .77 .75 .74
.72 .70 .67 .65 .63 .62 .60 .58 .57 .55 .54 .52 .51 .50 .48 .47 .46 .45
.43 .42 .41 .40 .39 .38 .37 .36 .35 .34 .33 .32 .32 .31 .30 .29 .29 .28
.27 .27 .26 .25 .25 .24 .23 .23 .23 .22 .22 .22 .22 .21 .21 .21 .20

26 .92 .92 .92 .92 .92 .92 .92 .91 .91 .91 .91 .91 .91 .90 .91 .90 .90 .90
.90 .89 .88 .88 .87 .87 .87 .86 .86 .85 .85 .84 .83 .81 .80 .78 .76 .75
.73 .71 .69 .66 .65 .63 .61 .60 .59 .57 .55 .54 .52 .51 .50 .49 .49 .46
.45 .44 .43 .42 .41 .40 .39 .38 .36 .36 .35 .34 .33 .32 .31 .30 .30 .29
.28 .28 .27 .26 .25 .25 .24 .24 .24 .24 .23 .23 .23 .22 .22 .22 .21

27 .92 .92 .92 .92 .92 .92 .92 .92 .91 .91 .91 .91 .91 .91 .91 .91 .91 .90
.90 .89 .89 .88 .88 .88 .87 .87 .87 .85 .85 .85 .85 .82 .81 .80 .77 .76
.75 .73 .71 .69 .66 .65 .64 .62 .60 .59 .57 .56 .55 .54 .52 .51 .51 .48
.47 .46 .45 .44 .43 .42 .41 .40 .39 .38 .37 .36 .35 .34 .33 .33 .32 .31
.31 .30 .29 .28 .27 .27 .26 .26 .25 .25 .25 .25 .24 .23 .23 .23 .22

28 .92 .92 .92 .92 .92 .92 .92 .92 .92 .91 .91 .91 .91 .91 .91 .91 .91 .91
.90 .90 .89 .89 .89 .89 .89 .87 .87 .85 .86 .85 .85 .83 .82 .81 .80 .78
.76 .75 .73 .71 .68 .67 .65 .64 .63 .61 .60 .58 .56 .55 .54 .53 .53 .50
.49 .48 .47 .46 .45 .44 .43 .42 .41 .40 .39 .38 .37 .36 .35 .35 .34 .33
.32 .31 .31 .30 .30 .29 .28 .28 .27 .27 .26 .26 .25 .25 .25 .25 .24

29 .92 .92 .92 .92 .92 .92 .92 .92 .92 .92 .92 .92 .91 .91 .91 .91 .91 .91
.90 .90 .90 .90 .88 .88 .88 .87 .87 .86 .86 .86 .85 .84 .83 .82 .81 .79
.77 .76 .75 .73 .70 .69 .67 .66 .65 .63 .62 .61 .59 .58 .56 .55 .55 .53
.51 .52 .49 .48 .47 .46 .45 .44 .43 .42 .41 .40 .39 .38 .37 .36 .35 .35
.34 .33 .33 .32 .31 .30 .30 .29 .28 .28 .26 .27 .27 .26 .26 .26 .25

30 .92 .92 .92 .92 .92 .92 .92 .92 .92 .92 .92 .92 .92 .91 .91 .91 .91 .91
.91 .90 .90 .90 .90 .89 .88 .86 .86 .86 .86 .86 .86 .85 .84 .83 .82 .80
.79 .78 .76 .74 .72 .71 .70 .68 .67 .65 .64 .63 .61 .60 .58 .57 .56 .55
.53 .54 .51 .50 .49 .48 .47 .46 .45 .44 .43 .42 .41 .40 .40 .39 .38 .37
.36 .35 .35 .34 .33 .32 .32 .32 .31 .30 .30 .29 .28 .28 .28 .28 .27

31 .92 .92 .92 .92 .92 .92 .92 .92 .92 .92 .92 .92 .92 .91 .91 .91 .91 .91
.91 .90 .90 .90 .90 .90 .89 .88 .88 .86 .87 .87 .86 .85 .85 .83 .82 .81
.81 .79 .78 .75 .73 .72 .71 .70 .68 .66 .65 .64 .62 .61 .60 .59 .58 .56
.55 .55 .53 .51 .50 .49 .48 .47 .46 .46 .45 .44 .43 .42 .41 .40 .39 .38
.37 .36 .36 .35 .34 .34 .33 .33 .32 .31 .30 .30 .29 .29 .29 .29 .29

32 .92 .92 .92 .92 .92 .92 .92 .92 .92 .92 .92 .92 .92 .92 .91 .91 .91 .91
.91 .91 .90 .90 .90 .90 .89 .88 .88 .87 .87 .87 .86 .86 .85 .84 .83 .82
.82 .80 .79 .77 .75 .74 .73 .71 .70 .69 .67 .66 .65 .63 .62 .61 .60 .58
.56 .56 .55 .54 .53 .51 .50 .49 .48 .47 .46 .45 .45 .43 .43 .42 .41 .40
.39 .38 .38 .37 .36 .35 .35 .34 .33 .33 .32 .32 .31 .30 .30 .30 .30

33 .92 .92 .92 .92 .92 .92 .92 .92 .92 .92 .92 .92 .92 .92 .92 .91 .91 .91
.91 .91 .91 .90 .90 .90 .90 .89 .88 .87 .87 .88 .87 .86 .86 .85 .84 .83
.83 .81 .80 .78 .77 .75 .74 .73 .71 .71 .70 .68 .66 .65 .64 .63 .63 .60
.59 .57 .56 .55 .54 .53 .52 .51 .50 .49 .48 .47 .46 .45 .45 .44 .43 .41
.40 .40 .39 .38 .37 .37 .37 .36 .35 .35 .34 .34 .33 .32 .32 .31 .31

34 .92 .92 .92 .92 .92 .92 .92 .92 .92 .92 .92 .92 .92 .92 .92 .92 .91 .91
.91 .91 .91 .91 .90 .90 .90 .90 .89 .87 .88 .88 .87 .86 .86 .85 .85 .84
.83 .82 .81 .80 .78 .77 .76 .75 .73 .73 .72 .71 .69 .67 .66 .65 .64 .62
.61 .60 .58 .57 .56 .55 .54 .53 .51 .51 .50 .49 .48 .47 .46 .45 .43 .43
.43 .42 .41 .40 .40 .39 .38 .38 .37 .36 .35 .35 .34 .34 .34 .33 .33

35 .92 .92 .92 .92 .92 .92 .92 .92 .92 .92 .92 .92 .92 .92 .92 .92 .92 .91
.91 .91 .91 .91 .90 .90 .90 .90 .89 .88 .88 .88 .87 .87 .87 .86 .85 .85
.84 .82 .81 .81 .80 .78 .77 .76 .75 .75 .73 .72 .70 .69 .68 .67 .66 .64
.63 .61 .60 .59 .58 .56 .56 .55 .54 .53 .52 .51 .50 .49 .48 .47 .46 .45
.45 .44 .43 .42 .41 .40 .40 .39 .38 .38 .36 .37 .36 .35 .35 .35 .35

36 .92 .92 .92 .92 .92 .92 .92 .92 .92 .92 .92 .92 .92 .92 .92 .92 .92 .91
.91 .91 .91 .91 .90 .90 .90 .90 .89 .88 .88 .88 .87 .87 .87 .86 .85 .85
.84 .83 .82 .82 .81 .80 .79 .78 .76 .76 .74 .73 .71 .71 .70 .69 .68 .65
.64 .63 .61 .60 .60 .58 .57 .56 .55 .54 .53 .52 .51 .50 .49 .48 .47 .46
.46 .45 .44 .43 .43 .41 .41 .40 .40 .39 .37 .38 .37 .36 .36 .35 .35

37 .92 .92 .92 .92 .92 .92 .92 .92 .92 .92 .92 .92 .92 .92 .92 .92 .92 .92
.91 .91 .91 .91 .91 .90 .90 .90 .90 .89 .89 .89 .88 .87 .87 .86 .86 .85
.85 .83 .82 .82 .81 .80 .79 .78 .76 .76 .74 .73 .71 .71 .70 .69 .68 .65
.64 .63 .61 .60 .60 .58 .57 .56 .55 .54 .53 .52 .51 .50 .49 .48 .47 .46
.46 .45 .44 .43 .43 .43 .43 .42 .41 .40 .40 .40 .38 .38 .37 .37 .36

38 .92 .92 .92 .92 .92 .92 .92 .92 .92 .92 .92 .92 .92 .92 .92 .92 .92 .92
.92 .91 .91 .91 .91 .91 .90 .90 .90 .89 .89 .89 .88 .88 .87 .87 .86 .86
.85 .85 .83 .83 .82 .81 .81 .80 .79 .78 .77 .76 .75 .74 .73 .72 .70 .70
.68 .67 .65 .64 .63 .62 .61 .60 .59 .58 .57 .56 .55 .54 .53 .52 .51 .50
.49 .48 .47 .47 .46 .45 .44 .43 .43 .42 .41 .41 .40 .40 .40 .39 .38

39 .92 .92 .92 .92 .92 .92 .92 .92 .92 .92 .92 .92 .92 .92 .92 .92 .92 .92
.92 .91 .91 .91 .91 .91 .91 .90 .90 .89 .89 .89 .89 .88 .88 .87 .87 .86
.86 .85 .84 .84 .83 .82 .82 .81 .80 .79 .78 .77 .76 .75 .74 .73 .71 .71
.70 .69 .67 .66 .65 .64 .63 .62 .61 .60 .59 .58 .56 .55 .55 .54 .53 .52
.51 .50 .49 .49 .47 .46 .46 .45 .44 .43 .43 .43 .41 .41 .41 .40 .40

40 .92 .92 .92 .92 .92 .92 .92 .92 .92 .92 .92 .92 .92 .92 .92 .92 .92 .92
.92 .92 .91 .91 .91 .91 .91 .91 .90 .90 .89 .89 .89 .88 .88 .87 .87 .87
.86 .86 .85 .85 .84 .83 .82 .82 .81 .80 .79 .78 .77 .76 .75 .74 .72 .72
.71 .70 .69 .67 .66 .65 .65 .64 .62 .61 .60 .60 .58 .57 .56 .55 .55 .54
.53 .52 .51 .50 .50 .49 .48 .47 .46 .45 .45 .45 .43 .42 .42 .42 .41

APPENDIX F

DATA 2 - Transverse subsidence profile, relationship between w/h and d/h for various points on the profile

File: Data2 'Number 2 file of 7

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.	0.20	0.80	0.64	0.57	0.48	0.41	0.37	0.32	0.28	0.23	0.19	0.13	0.08	0.00
3.	0.22	0.81	0.63	0.53	0.46	0.39	0.34	0.30	0.26	0.21	0.17	0.11	0.08	0.00
4.	0.24	0.82	0.62	0.53	0.43	0.36	0.32	0.28	0.24	0.20	0.16	0.11	0.07	0.00
5.	0.26	0.83	0.62	0.52	0.41	0.35	0.30	0.26	0.22	0.17	0.15	0.10	0.07	0.00
6.	0.28	0.84	0.61	0.51	0.39	0.33	0.28	0.24	0.21	0.18	0.14	0.09	0.07	0.00
7.	0.30	0.85	0.61	0.50	0.38	0.32	0.27	0.23	0.20	0.17	0.13	0.09	0.06	0.00
8.	0.32	0.86	0.60	0.49	0.37	0.31	0.26	0.22	0.20	0.16	0.13	0.09	0.06	0.00
9.	0.34	0.87	0.60	0.48	0.36	0.30	0.25	0.22	0.19	0.16	0.12	0.08	0.06	0.00
10.	0.36	0.88	0.60	0.48	0.35	0.29	0.25	0.21	0.18	0.15	0.12	0.08	0.06	0.00
11.	0.38	0.89	0.60	0.48	0.35	0.29	0.24	0.21	0.18	0.15	0.12	0.08	0.06	0.00
12.	0.40	0.90	0.59	0.47	0.34	0.28	0.24	0.21	0.18	0.15	0.12	0.08	0.06	0.00
13.	0.42	0.91	0.59	0.47	0.34	0.28	0.24	0.20	0.17	0.15	0.12	0.08	0.06	0.00
14.	0.44	0.92	0.59	0.47	0.33	0.28	0.23	0.20	0.17	0.15	0.12	0.08	0.06	0.00
15.	0.46	0.93	0.59	0.47	0.33	0.28	0.23	0.20	0.17	0.15	0.12	0.08	0.06	0.00
16.	0.48	0.94	0.59	0.47	0.33	0.28	0.23	0.20	0.17	0.15	0.12	0.08	0.06	0.00
17.	0.50	0.95	0.59	0.47	0.34	0.28	0.24	0.21	0.17	0.15	0.12	0.08	0.06	0.00
18.	0.52	0.96	0.59	0.47	0.34	0.28	0.24	0.21	0.17	0.15	0.12	0.08	0.06	0.00
19.	0.54	0.97	0.59	0.47	0.34	0.29	0.25	0.21	0.18	0.15	0.12	0.08	0.06	0.00
20.	0.56	0.98	0.59	0.47	0.35	0.29	0.25	0.21	0.18	0.15	0.12	0.08	0.06	0.00
21.	0.58	0.99	0.59	0.47	0.35	0.30	0.25	0.22	0.18	0.16	0.13	0.09	0.06	0.00
22.	0.60	1.00	0.59	0.47	0.36	0.30	0.26	0.22	0.19	0.16	0.13	0.09	0.06	0.00
23.	0.62	1.01	0.59	0.47	0.37	0.31	0.27	0.23	0.19	0.16	0.13	0.09	0.06	0.00
24.	0.64	1.02	0.59	0.48	0.37	0.31	0.27	0.23	0.20	0.17	0.13	0.09	0.06	0.00
25.	0.66	1.03	0.60	0.48	0.38	0.32	0.28	0.24	0.20	0.17	0.14	0.09	0.06	0.00
26.	0.68	1.04	0.60	0.49	0.38	0.32	0.28	0.24	0.21	0.17	0.14	0.10	0.07	0.00
27.	0.70	1.05	0.60	0.49	0.39	0.32	0.29	0.25	0.21	0.18	0.14	0.10	0.07	0.00
28.	0.72	1.06	0.61	0.50	0.39	0.34	0.30	0.26	0.22	0.18	0.15	0.10	0.07	0.00
29.	0.74	1.07	0.61	0.50	0.40	0.34	0.30	0.26	0.23	0.19	0.15	0.10	0.07	0.00
30.	0.76	1.08	0.62	0.51	0.41	0.35	0.31	0.27	0.23	0.20	0.16	0.11	0.07	0.00
31.	0.78	1.09	0.63	0.52	0.42	0.36	0.32	0.28	0.24	0.20	0.16	0.11	0.08	0.00
32.	0.80	1.10	0.63	0.52	0.42	0.36	0.32	0.28	0.25	0.21	0.17	0.11	0.08	0.00
33.	0.82	1.11	0.64	0.53	0.43	0.37	0.33	0.29	0.26	0.21	0.17	0.12	0.08	0.00
34.	0.84	1.12	0.65	0.54	0.44	0.38	0.34	0.30	0.26	0.22	0.18	0.12	0.09	0.00
35.	0.86	1.13	0.66	0.55	0.45	0.39	0.35	0.31	0.27	0.23	0.18	0.13	0.09	0.00
36.	0.88	1.14	0.67	0.56	0.45	0.40	0.36	0.32	0.28	0.24	0.20	0.13	0.10	0.00
37.	0.90	1.15	0.68	0.57	0.46	0.40	0.36	0.32	0.29	0.25	0.20	0.14	0.10	0.00
38.	0.92	1.16	0.68	0.57	0.47	0.41	0.37	0.33	0.30	0.26	0.21	0.15	0.10	0.00
39.	0.94	1.17	0.69	0.58	0.48	0.42	0.38	0.34	0.31	0.26	0.22	0.16	0.11	0.00
40.	0.96	1.18	0.70	0.59	0.49	0.42	0.39	0.35	0.32	0.27	0.22	0.16	0.11	0.00
41.	0.98	1.19	0.71	0.60	0.50	0.44	0.40	0.36	0.33	0.28	0.24	0.17	0.12	0.00
42.	1.00	1.20	0.72	0.61	0.51	0.45	0.41	0.37	0.33	0.29	0.24	0.18	0.00	0.00
43.	1.10	1.25	0.77	0.65	0.55	0.50	0.45	0.42	0.38	0.34	0.29	0.21	0.16	0.00
44.	1.20	1.30	0.81	0.70	0.60	0.54	0.50	0.46	0.42	0.38	0.33	0.25	0.19	0.00
45.	1.30	1.35	0.86	0.75	0.65	0.59	0.55	0.51	0.47	0.43	0.38	0.30	0.23	0.00
46.	1.40	1.40	0.91	0.80	0.70	0.64	0.60	0.56	0.52	0.48	0.43	0.35	0.27	0.01
47.	1.60	1.50	1.01	0.90	0.80	0.74	0.70	0.66	0.62	0.58	0.53	0.45	0.37	0.03
48.	1.80	1.60	1.11	1.00	0.90	0.84	0.80	0.76	0.72	0.68	0.63	0.55	0.47	0.10
49.	2.00	1.70	1.21	1.09	0.99	0.94	0.90	0.86	0.82	0.78	0.73	0.65	0.57	0.18
50.	2.20	1.80	1.31	1.19	1.09	1.04	1.00	0.96	0.92	0.88	0.83	0.75	0.67	0.27

51.	2.40	1.90	1.41	1.29	1.19	1.14	1.10	1.06	1.02	0.98	0.93	0.85	0.77	0.31
52.	2.60	2.00	1.51	1.39	1.29	1.24	1.19	1.16	1.12	1.08	1.03	0.95	0.87	0.41
53.	2.80	2.10	1.61	1.49	1.39	1.34	1.29	1.26	1.22	1.18	1.13	1.05	0.97	0.51
54.	3.00	2.20	1.71	1.59	1.49	1.44	1.39	1.36	1.32	1.28	1.23	1.15	1.07	0.61
55.	3.20	2.30	1.81	1.69	1.59	1.54	1.49	1.46	1.42	1.38	1.33	1.25	1.17	0.71
56.	3.40	2.40	1.91	1.79	1.69	1.64	1.59	1.56	1.52	1.48	1.43	1.35	1.27	0.81
57.	3.60	2.50	2.01	1.89	1.79	1.74	1.69	1.66	1.62	1.58	1.53	1.45	1.37	0.91
58.	3.80	2.60	2.11	1.99	1.89	1.84	1.79	1.76	1.72	1.68	1.63	1.55	1.47	1.01
59.	4.00	2.70	2.21	2.09	1.99	1.94	1.89	1.86	1.82	1.78	1.73	1.65	1.57	1.11
60.	4.20	2.80	2.31	2.19	2.09	2.04	1.99	1.96	1.92	1.88	1.83	1.75	1.67	1.21
61.	4.40	2.90	2.41	2.29	2.19	2.14	2.09	2.06	2.02	1.98	1.93	1.85	1.77	1.31
62.	4.60	3.00	2.51	2.39	2.29	2.24	2.19	2.16	2.12	2.08	2.03	1.95	1.87	1.41
63.	4.80	3.10	2.61	2.49	2.39	2.34	2.29	2.26	2.22	2.18	2.13	2.05	1.97	1.51
64.	5.00	3.20	2.71	2.59	2.49	2.44	2.39	2.36	2.32	2.28	2.23	2.15	2.07	1.61
65.	5.20	3.30	2.81	2.69	2.59	2.54	2.49	2.46	2.42	2.38	2.33	2.25	2.17	1.71
66.	5.40	3.40	2.91	2.79	2.69	2.64	2.59	2.56	2.52	2.48	2.43	2.35	2.27	1.81
67.	5.60	3.50	3.01	2.89	2.79	2.74	2.69	2.66	2.62	2.58	2.53	2.45	2.37	1.91
68.	5.80	3.60	3.11	2.99	2.89	2.84	2.79	2.76	2.72	2.68	2.63	2.55	2.47	2.01
69.	6.00	3.70	3.21	3.09	2.99	2.94	2.89	2.86	2.82	2.78	2.73	2.65	2.57	2.11
70.	6.20	3.80	3.31	3.19	3.09	3.04	2.99	2.96	2.92	2.88	2.83	2.75	2.67	2.21
71.	6.40	3.90	3.41	3.29	3.19	3.14	3.09	3.06	3.02	2.98	2.93	2.85	2.77	2.31
72.	6.60	4.00	3.51	3.39	3.29	3.24	3.19	3.16	3.12	3.08	3.03	2.95	2.87	2.41
73.	6.80	4.10	3.61	3.49	3.39	3.34	3.29	3.26	3.22	3.18	3.13	3.05	2.97	2.51
74.	7.20	4.30	3.81	3.69	3.59	3.54	3.49	3.46	3.42	3.38	3.33	3.25	3.17	2.71
75.	7.40	4.40	3.91	3.79	3.69	3.64	3.59	3.56	3.52	3.48	3.43	3.35	3.27	2.81
76.	7.60	4.50	4.01	3.89	3.79	3.74	3.69	3.66	3.62	3.58	3.53	3.45	3.37	2.91
77.	7.80	4.60	4.11	3.99	3.89	3.84	3.79	3.76	3.72	3.68	3.63	3.55	3.47	3.01
78.	8.00	4.70	4.21	4.09	3.99	3.94	3.89	3.86	3.82	3.78	3.73	3.65	3.57	3.11
79.	8.20	4.80	4.31	4.19	4.09	4.04	3.99	3.96	3.92	3.88	3.83	3.75	3.67	3.21
80.	8.40	4.90	4.41	4.29	4.19	4.14	4.09	4.06	4.02	3.98	3.93	3.85	3.77	3.31
81.	8.60	5.00	4.51	4.39	4.29	4.24	4.19	4.16	4.12	4.08	4.03	3.95	3.87	3.41
82.	8.80	5.10	4.61	4.49	4.39	4.34	4.29	4.26	4.22	4.18	4.13	4.05	3.97	3.51
83.	9.00	5.20	4.71	4.59	4.49	4.44	4.39	4.36	4.32	4.28	4.23	4.15	4.07	3.61
84.	9.20	5.30	4.81	4.69	4.59	4.54	4.49	4.46	4.42	4.38	4.33	4.25	4.17	3.71
85.	9.40	5.40	4.91	4.79	4.69	4.64	4.59	4.56	4.52	4.48	4.43	4.35	4.27	3.81
86.	9.60	5.50	5.01	4.89	4.79	4.74	4.69	4.66	4.62	4.58	4.53	4.45	4.37	3.91
87.	9.80	5.60	5.11	4.99	4.89	4.84	4.79	4.76	4.72	4.68	4.63	4.55	4.47	4.01
88.	10.00	5.70	5.21	5.09	4.99	4.94	4.89	4.86	4.82	4.78	4.73	4.65	4.57	4.11
89.	10.20	5.80	5.31	5.19	5.09	5.04	4.99	4.96	4.92	4.88	4.83	4.75	4.67	4.21
90.	10.40	5.90	5.41	5.29	5.19	5.14	5.09	5.06	5.02	4.98	4.93	4.85	4.77	4.31
91.	10.60	6.00	5.51	5.39	5.29	5.24	5.19	5.16	5.12	5.08	5.03	4.95	4.87	4.41
92.	10.80	6.10	5.61	5.49	5.39	5.34	5.29	5.26	5.22	5.18	5.13	5.05	4.97	4.51
93.	11.00	6.20	5.71	5.59	5.49	5.44	5.39	5.36	5.32	5.28	5.23	5.15	5.07	4.61
94.	11.20	6.30	5.81	5.69	5.59	5.54	5.49	5.46	5.42	5.38	5.33	5.25	5.17	4.71
95.	11.40	6.40	5.91	5.79	5.69	5.64	5.59	5.56	5.52	5.48	5.43	5.35	5.27	4.81
96.	11.60	6.50	6.01	5.89	5.79	5.74	5.69	5.66	5.62	5.58	5.53	5.45	5.37	4.91
97.	11.80	6.60	6.11	5.99	5.89	5.84	5.79	5.76	5.72	5.68	5.63	5.55	5.47	5.01
98.	12.00	6.70	6.21	6.09	5.99	5.94	5.89	5.86	5.82	5.78	5.73	5.65	5.57	5.11
99.	12.20	6.80	6.31	6.19	6.09	6.04	5.99	5.96	5.92	5.88	5.83	5.75	5.67	5.21
100.	12.40	6.90	6.41	6.29	6.19	6.14	6.09	6.06	6.02	5.98	5.93	5.85	5.77	5.31
101.	12.60	7.00	6.51	6.39	6.29	6.24	6.19	6.16	6.12	6.08	6.03	5.95	5.87	5.41
102.	12.80	7.10	6.61	6.49	6.39	6.34	6.29	6.26	6.22	6.18	6.13	6.05	5.97	5.51
103.	13.00	7.20	6.71	6.59	6.49	6.44	6.39	6.36	6.32	6.28	6.23	6.15	6.07	5.61
104.	13.20	7.30	6.81	6.69	6.59	6.54	6.49	6.46	6.42	6.38	6.33	6.25	6.17	5.71
105.	13.40	7.40	6.91	6.79	6.69	6.64	6.59	6.56	6.52	6.48	6.43	6.35	6.27	5.81

106.	13.60	7.50	7.01	6.89	6.79	6.74	6.69	6.66	6.62	6.58	6.53	6.45	6.37	6.91
107.	13.80	7.60	7.11	6.99	6.89	6.84	6.79	6.76	6.72	6.68	6.63	6.55	6.47	6.01
108.	14.00	7.70	7.21	7.09	6.99	6.94	6.89	6.86	6.82	6.78	6.73	6.65	6.57	6.11

APPENDIX G

DATA 3 - Maximum tensile and compressive strain factors for various w/h ratios

File: Data3 'Number 3 file of 7'

	A	B	C
1	0.20	0.55	2.25
2	0.22	0.60	2.20
3	0.24	0.60	2.20
4	0.26	0.65	2.10
5	0.28	0.65	2.05
6	0.30	0.70	2.00
7	0.32	0.70	1.95
8	0.34	0.75	1.90
9	0.36	0.80	1.85
10	0.38	0.80	1.80
11	0.40	0.80	1.70
12	0.42	0.80	1.65
13	0.44	0.80	1.60
14	0.46	0.85	1.50
15	0.48	0.80	1.45
16	0.50	0.80	1.40
17	0.52	0.80	1.30
18	0.54	0.80	1.20
19	0.56	0.80	1.15
20	0.58	0.80	1.10
21	0.60	0.80	1.05
22	0.62	0.75	1.00
23	0.64	0.75	0.95
24	0.66	0.70	0.90
25	0.68	0.70	0.90
26	0.70	0.70	0.85
27	0.72	0.70	0.80
28	0.74	0.70	0.80
29	0.76	0.65	0.75
30	0.78	0.65	0.70
31	0.82	0.65	0.70
32	0.84	0.65	0.65
33	0.86	0.65	0.60
34	0.88	0.65	0.60
35	0.90	0.65	0.60
36	0.92	0.65	0.60
37	0.94	0.65	0.60
38	0.96	0.65	0.60
39	0.98	0.65	0.60
40	1.00	0.65	0.55
41	1.10	0.65	0.55
42	0.96	0.65	0.60
43	1.30	0.65	0.50
44	1.60	0.65	0.50
45	1.60	0.65	0.50
46	1.80	0.65	0.50
47	2.00	0.65	0.50
48	2.20	0.65	0.50
49	2.40	0.65	0.50

50	2.60	0.65	0.50
51	2.80	0.65	0.50
52	3.00	0.65	0.50
53	3.20	0.65	0.50
54	3.40	0.65	0.50
55	3.60	0.65	0.50
56	3.80	0.65	0.50
57	4.00	0.65	0.50
58	4.20	0.65	0.50
59	4.40	0.65	0.50
60	4.60	0.65	0.50
61	4.80	0.65	0.50
62	5.00	0.65	0.50
63	5.20	0.65	0.50
64	5.40	0.65	0.50
65	5.60	0.65	0.50
66	5.80	0.65	0.50
67	6.00	0.65	0.50
68	6.20	0.65	0.50
69	6.40	0.65	0.50
70	6.60	0.65	0.50
71	6.80	0.65	0.50
72	7.00	0.65	0.50
73	7.20	0.65	0.50
74	7.40	0.65	0.50
75	7.60	0.65	0.50
76	7.80	0.65	0.50
77	8.00	0.65	0.50
78	8.20	0.65	0.50
79	8.40	0.65	0.50
80	8.60	0.65	0.50
81	8.80	0.65	0.50
82	9.00	0.65	0.50
83	9.20	0.65	0.50
84	9.40	0.65	0.50
85	9.60	0.65	0.50
86	9.80	0.65	0.50
87	10.00	0.65	0.50
88	10.20	0.65	0.50
89	10.40	0.65	0.50
90	10.60	0.65	0.50
91	10.80	0.65	0.50
92	11.00	0.65	0.50
93	11.20	0.65	0.50
94	11.40	0.65	0.50
95	11.60	0.65	0.50
96	11.80	0.65	0.50
97	12.00	0.65	0.50
98	12.20	0.65	0.50
99	12.40	0.65	0.50
100	12.60	0.65	0.50
101	12.80	0.65	0.50
102	13.00	0.65	0.50
103	13.20	0.65	0.50
104	13.40	0.65	0.50

105	13.60	0.65	0.50
106	13.80	0.65	0.50
107	14.00	0.65	0.50

APPENDIX H

DATA 4 - Transverse strain profile, relationship between w/h and d/h for various points on the profile

File: Data4 'Number 4 of 7'

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
1	0.20	0.80	0.74	0.69	0.66	0.61	0.49	0.42	0.38	0.27	0.23	0.18	0.12	0.00	0.00	0.00	0.00	0.00	0.00
2	0.22	0.81	0.72	0.66	0.63	0.58	0.47	0.39	0.36	0.23	0.21	0.16	0.11	0.00	0.00	0.00	0.00	0.00	0.00
3	0.24	0.82	0.70	0.63	0.60	0.54	0.44	0.37	0.34	0.23	0.20	0.15	0.10	0.00	0.00	0.00	0.00	0.00	0.00
4	0.26	0.83	0.68	0.60	0.57	0.51	0.41	0.35	0.32	0.22	0.18	0.14	0.09	0.00	0.00	0.00	0.00	0.00	0.00
5	0.28	0.84	0.66	0.58	0.54	0.49	0.39	0.33	0.30	0.21	0.17	0.08	0.13	0.00	0.00	0.00	0.00	0.00	0.00
6	0.30	0.85	0.65	0.57	0.51	0.47	0.37	0.32	0.28	0.20	0.16	0.12	0.08	0.00	0.00	0.00	0.00	0.00	0.00
7	0.32	0.86	0.63	0.55	0.49	0.45	0.35	0.30	0.26	0.19	0.16	0.12	0.07	0.00	0.00	0.00	0.00	0.00	0.00
8	0.34	0.87	0.62	0.54	0.48	0.43	0.34	0.30	0.24	0.19	0.15	0.11	0.07	0.00	0.00	0.00	0.00	0.00	0.00
9	0.36	0.88	0.62	0.53	0.46	0.42	0.33	0.29	0.23	0.18	0.15	0.11	0.07	0.00	0.00	0.00	0.00	0.00	0.00
10	0.38	0.89	0.61	0.53	0.45	0.41	0.32	0.28	0.22	0.18	0.15	0.11	0.07	0.00	0.00	0.00	0.00	0.00	0.00
11	0.40	0.90	0.61	0.52	0.45	0.40	0.32	0.28	0.22	0.18	0.15	0.11	0.07	0.00	0.00	0.00	0.00	0.00	0.00
12	0.42	0.91	0.60	0.51	0.44	0.39	0.31	0.27	0.21	0.18	0.15	0.11	0.07	0.00	0.00	0.00	0.00	0.00	0.00
13	0.44	0.92	0.60	0.51	0.43	0.39	0.31	0.27	0.21	0.18	0.15	0.11	0.07	0.01	0.00	0.00	0.00	0.00	0.00
14	0.46	0.93	0.60	0.51	0.43	0.38	0.31	0.27	0.21	0.18	0.15	0.11	0.08	0.01	0.00	0.00	0.00	0.00	0.00
15	0.48	0.94	0.60	0.51	0.43	0.38	0.31	0.27	0.20	0.18	0.15	0.12	0.08	0.01	0.00	0.00	0.00	0.00	0.00
16	0.50	0.95	0.60	0.51	0.43	0.38	0.32	0.27	0.20	0.18	0.16	0.12	0.08	0.02	0.00	0.00	0.00	0.00	0.00
17	0.52	0.96	0.60	0.51	0.43	0.38	0.32	0.27	0.20	0.18	0.16	0.12	0.09	0.02	0.00	0.00	0.00	0.00	0.00
18	0.54	0.97	0.61	0.51	0.43	0.39	0.32	0.28	0.20	0.19	0.16	0.13	0.09	0.03	0.00	0.00	0.00	0.00	0.00
19	0.56	0.98	0.61	0.51	0.44	0.39	0.33	0.28	0.21	0.19	0.17	0.13	0.10	0.03	0.00	0.00	0.00	0.00	0.00
20	0.58	0.99	0.62	0.51	0.44	0.39	0.33	0.29	0.21	0.19	0.17	0.14	0.10	0.04	0.00	0.00	0.00	0.00	0.00
21	0.60	1.00	0.62	0.52	0.45	0.40	0.34	0.29	0.21	0.20	0.18	0.14	0.11	0.05	0.00	0.00	0.00	0.00	0.00
22	0.62	1.01	0.63	0.52	0.45	0.41	0.34	0.30	0.22	0.21	0.18	0.15	0.12	0.05	0.00	0.00	0.00	0.00	0.00
23	0.64	1.02	0.63	0.53	0.46	0.41	0.35	0.31	0.22	0.21	0.19	0.15	0.12	0.06	0.00	0.00	0.00	0.00	0.00
24	0.66	1.03	0.64	0.53	0.47	0.42	0.36	0.31	0.22	0.22	0.19	0.16	0.13	0.07	0.00	0.00	0.00	0.00	0.00
25	0.68	1.04	0.64	0.54	0.47	0.43	0.37	0.32	0.23	0.22	0.20	0.16	0.13	0.07	0.00	0.00	0.00	0.00	0.00
26	0.70	1.05	0.65	0.54	0.48	0.44	0.37	0.33	0.23	0.20	0.17	0.14	0.08	0.00	0.00	0.00	0.00	0.00	0.00
27	0.72	1.06	0.66	0.55	0.49	0.44	0.38	0.34	0.24	0.24	0.21	0.17	0.13	0.09	0.00	0.00	0.00	0.00	0.00
28	0.74	1.07	0.67	0.56	0.50	0.45	0.39	0.35	0.24	0.24	0.22	0.18	0.15	0.09	0.01	0.00	0.00	0.00	0.00
29	0.76	1.08	0.67	0.57	0.51	0.46	0.40	0.36	0.25	0.25	0.22	0.19	0.16	0.10	0.01	0.00	0.00	0.00	0.00
30	0.78	1.09	0.68	0.57	0.52	0.47	0.41	0.36	0.26	0.26	0.23	0.20	0.17	0.11	0.02	0.00	0.00	0.00	0.00
31	0.80	1.10	0.69	0.58	0.53	0.48	0.42	0.37	0.25	0.26	0.24	0.20	0.17	0.11	0.02	0.00	0.00	0.00	0.00
32	0.82	1.11	0.70	0.59	0.53	0.48	0.43	0.38	0.25	0.27	0.25	0.21	0.18	0.12	0.03	0.00	0.00	0.00	0.00
33	0.84	1.12	0.71	0.60	0.54	0.49	0.44	0.39	0.30	0.28	0.25	0.22	0.19	0.13	0.04	0.00	0.00	0.00	0.00
34	0.86	1.13	0.72	0.61	0.55	0.50	0.45	0.40	0.31	0.29	0.26	0.23	0.20	0.14	0.05	0.00	0.00	0.00	0.00
35	0.88	1.14	0.73	0.62	0.56	0.51	0.46	0.41	0.32	0.29	0.27	0.24	0.21	0.15	0.05	0.01	0.00	0.00	0.00
36	0.90	1.15	0.74	0.63	0.57	0.52	0.46	0.42	0.33	0.30	0.28	0.24	0.21	0.15	0.06	0.02	0.00	0.00	0.00
37	0.92	1.16	0.75	0.64	0.58	0.53	0.47	0.43	0.34	0.31	0.29	0.25	0.22	0.16	0.07	0.02	0.00	0.00	0.00
38	0.94	1.17	0.76	0.65	0.59	0.54	0.48	0.44	0.35	0.32	0.30	0.26	0.23	0.17	0.08	0.03	0.00	0.00	0.00
39	0.96	1.18	0.77	0.66	0.60	0.55	0.49	0.45	0.35	0.33	0.30	0.27	0.24	0.18	0.09	0.04	0.00	0.00	0.00
40	0.98	1.19	0.78	0.67	0.61	0.56	0.50	0.46	0.36	0.34	0.31	0.28	0.25	0.19	0.09	0.04	0.00	0.00	0.00
41	1.00	1.20	0.79	0.68	0.62	0.57	0.51	0.47	0.37	0.35	0.32	0.29	0.26	0.20	0.10	0.05	0.00	0.00	0.00
42	1.10	1.25	0.85	0.72	0.66	0.61	0.56	0.52	0.42	0.39	0.37	0.33	0.31	0.24	0.15	0.09	0.03	0.00	0.00
43	1.20	1.30	0.88	0.77	0.71	0.66	0.61	0.56	0.46	0.44	0.41	0.38	0.35	0.29	0.20	0.13	0.07	0.02	0.00
44	1.30	1.35	0.93	0.82	0.76	0.70	0.65	0.61	0.51	0.49	0.46	0.43	0.40	0.34	0.25	0.18	0.12	0.05	0.00
45	1.40	1.40	0.98	0.87	0.81	0.75	0.70	0.66	0.56	0.53	0.51	0.48	0.45	0.39	0.30	0.20	0.20	0.10	0.00
46	1.60	1.50	1.10	1.00	0.91	0.85	0.80	0.76	0.66	0.63	0.61	0.58	0.55	0.49	0.40	0.30	0.30	0.20	0.00
47	1.80	1.60	1.20	1.10	1.00	0.95	0.90	0.86	0.76	0.73	0.71	0.68	0.65	0.59	0.50	0.40	0.40	0.30	0.10
48	2.00	1.70	1.30	1.20	1.10	1.10	1.00	1.00	0.90	0.80	0.80	0.80	0.70	0.70	0.60	0.50	0.47	0.40	0.20
49	2.20	1.80	1.40	1.30	1.20	1.20	1.10	1.10	1.00	0.90	0.90	0.90	0.80	0.80	0.70	0.60	0.57	0.50	0.30
50	2.40	1.90	1.50	1.40	1.30	1.30	1.20	1.20	1.10	1.00	1.00	1.00	0.90	0.90	0.80	0.70	0.67	0.60	0.40

51	2.60	2.00	1.60	1.50	1.40	1.40	1.30	1.30	1.20	1.10	1.10	1.10	1.00	1.00	0.90	0.83	0.77	0.70	0.50
52	2.80	2.10	1.70	1.60	1.50	1.50	1.40	1.40	1.30	1.20	1.20	1.20	1.10	1.10	1.00	0.95	0.88	0.80	0.60
53	3.00	2.20	1.80	1.70	1.60	1.60	1.50	1.50	1.40	1.30	1.30	1.30	1.20	1.20	1.10	1.00	1.00	0.90	0.70
54	3.20	2.30	1.90	1.80	1.70	1.70	1.60	1.50	1.50	1.40	1.40	1.40	1.30	1.30	1.20	1.10	1.10	1.00	0.80
55	3.40	2.40	2.00	1.90	1.80	1.70	1.70	1.60	1.50	1.50	1.50	1.40	1.40	1.40	1.30	1.20	1.20	1.10	0.90
56	3.60	2.50	2.10	2.00	1.90	1.80	1.80	1.70	1.60	1.60	1.60	1.50	1.50	1.50	1.40	1.30	1.30	1.20	1.00
57	3.80	2.60	2.20	2.10	2.00	1.90	1.90	1.80	1.70	1.70	1.70	1.60	1.60	1.60	1.50	1.40	1.40	1.30	1.10
58	4.00	2.70	2.30	2.20	2.10	2.00	2.00	1.90	1.80	1.80	1.80	1.70	1.70	1.70	1.60	1.50	1.50	1.40	1.20
59	4.20	2.80	2.40	2.30	2.20	2.10	2.10	2.00	1.90	1.90	1.90	1.80	1.80	1.80	1.70	1.60	1.50	1.50	1.30
60	4.40	2.90	2.50	2.40	2.30	2.20	2.20	2.10	2.00	2.00	2.00	1.90	1.90	1.90	1.80	1.70	1.60	1.60	1.40
61	4.60	3.00	2.60	2.50	2.40	2.30	2.30	2.20	2.10	2.10	2.10	2.00	2.00	2.00	1.90	1.80	1.70	1.70	1.50
62	4.80	3.10	2.70	2.60	2.50	2.40	2.40	2.30	2.20	2.20	2.20	2.10	2.10	2.10	2.00	1.90	1.80	1.80	1.60
63	5.00	3.20	2.80	2.70	2.60	2.50	2.50	2.40	2.30	2.30	2.30	2.20	2.20	2.20	2.10	2.00	1.90	1.90	1.70
64	5.20	3.30	2.90	2.80	2.70	2.60	2.60	2.50	2.40	2.40	2.40	2.30	2.30	2.30	2.20	2.10	2.00	2.00	1.80
65	5.40	3.40	3.00	2.90	2.80	2.70	2.70	2.60	2.50	2.50	2.50	2.40	2.40	2.40	2.30	2.20	2.10	2.10	1.90
66	5.60	3.50	3.10	3.00	2.90	2.80	2.80	2.70	2.60	2.60	2.60	2.50	2.50	2.50	2.40	2.30	2.20	2.20	2.00
67	5.80	3.60	3.20	3.10	3.00	2.90	2.90	2.80	2.70	2.70	2.70	2.60	2.60	2.60	2.50	2.40	2.30	2.30	2.10
68	6.00	3.70	3.30	3.20	3.10	3.00	3.00	2.90	2.80	2.80	2.80	2.70	2.70	2.70	2.60	2.50	2.40	2.40	2.20
69	6.20	3.80	3.40	3.30	3.20	3.10	3.10	3.00	2.90	2.90	2.90	2.80	2.80	2.80	2.70	2.60	2.50	2.50	2.30
70	6.40	3.90	3.50	3.40	3.30	3.20	3.20	3.10	3.00	3.00	3.00	2.90	2.90	2.90	2.80	2.70	2.60	2.60	2.40
71	6.60	4.00	3.60	3.50	3.40	3.30	3.30	3.20	3.10	3.10	3.10	3.00	3.00	3.00	2.90	2.80	2.70	2.70	2.50
72	6.80	4.10	3.70	3.60	3.50	3.40	3.40	3.30	3.20	3.20	3.20	3.10	3.10	3.10	3.00	2.90	2.80	2.80	2.60
73	7.00	4.20	3.80	3.70	3.60	3.50	3.50	3.40	3.30	3.30	3.30	3.20	3.20	3.20	3.10	3.00	2.90	2.90	2.70
74	7.20	4.30	3.90	3.80	3.70	3.60	3.60	3.50	3.40	3.40	3.40	3.30	3.30	3.30	3.20	3.10	3.00	3.00	2.80
75	7.40	4.40	4.00	3.90	3.80	3.70	3.70	3.60	3.50	3.50	3.50	3.40	3.40	3.40	3.30	3.20	3.10	3.10	2.90
76	7.60	4.50	4.10	4.00	3.90	3.80	3.80	3.70	3.60	3.60	3.60	3.50	3.50	3.50	3.40	3.30	3.20	3.20	3.00
77	7.80	4.60	4.20	4.10	4.00	3.90	3.90	3.80	3.70	3.70	3.70	3.60	3.60	3.60	3.50	3.40	3.30	3.30	3.10
78	8.00	4.70	4.30	4.20	4.10	4.00	4.00	3.90	3.80	3.80	3.80	3.70	3.70	3.70	3.60	3.50	3.40	3.40	3.20
79	8.20	4.80	4.40	4.30	4.20	4.10	4.10	4.00	3.90	3.90	3.90	3.80	3.80	3.80	3.70	3.60	3.50	3.50	3.30
80	8.40	4.90	4.50	4.40	4.30	4.20	4.20	4.10	4.00	4.00	4.00	3.90	3.90	3.90	3.80	3.70	3.60	3.60	3.40
81	8.60	5.00	4.60	4.50	4.40	4.30	4.30	4.20	4.10	4.10	4.10	4.00	4.00	4.00	3.90	3.80	3.70	3.70	3.50
82	8.80	5.10	4.70	4.60	4.50	4.40	4.40	4.30	4.20	4.20	4.20	4.10	4.10	4.10	4.00	3.90	3.80	3.80	3.60
83	9.00	5.20	4.80	4.70	4.60	4.50	4.50	4.40	4.30	4.30	4.30	4.20	4.20	4.20	4.10	4.00	3.90	3.90	3.70
84	9.20	5.30	4.90	4.80	4.70	4.60	4.60	4.50	4.40	4.40	4.40	4.30	4.30	4.30	4.20	4.10	4.00	4.00	3.80
85	9.40	5.40	5.00	4.90	4.80	4.70	4.70	4.60	4.50	4.50	4.50	4.40	4.40	4.40	4.30	4.20	4.10	4.10	3.90
86	9.60	5.50	5.10	5.00	4.90	4.80	4.80	4.70	4.60	4.60	4.60	4.50	4.50	4.50	4.40	4.30	4.20	4.20	4.00
87	9.80	5.60	5.20	5.10	5.00	4.90	4.90	4.80	4.70	4.70	4.70	4.60	4.60	4.60	4.50	4.40	4.30	4.30	4.10
88	10.00	5.70	5.30	5.20	5.10	5.00	5.00	4.90	4.80	4.80	4.80	4.70	4.70	4.70	4.60	4.50	4.40	4.40	4.20
89	10.20	5.80	5.40	5.30	5.20	5.10	5.10	5.00	4.90	4.90	4.90	4.80	4.80	4.80	4.70	4.60	4.50	4.50	4.30
90	10.40	5.90	5.50	5.40	5.30	5.20	5.20	5.10	5.00	5.00	5.00	4.90	4.90	4.90	4.80	4.70	4.60	4.60	4.40
91	10.60	6.00	5.60	5.50	5.40	5.30	5.30	5.20	5.10	5.10	5.10	5.00	5.00	5.00	4.90	4.80	4.70	4.70	4.50
92	10.80	6.10	5.70	5.60	5.50	5.40	5.40	5.30	5.20	5.20	5.20	5.10	5.10	5.10	5.00	4.90	4.80	4.80	4.60
93	11.00	6.20	5.80	5.70	5.60	5.50	5.50	5.40	5.30	5.30	5.30	5.20	5.20	5.20	5.10	5.00	4.90	4.90	4.70
94	11.20	6.30	5.90	5.80	5.70	5.60	5.60	5.50	5.40	5.40	5.40	5.30	5.30	5.30	5.20	5.10	5.00	5.00	4.80
95	11.40	6.40	6.00	5.90	5.80	5.70	5.70	5.60	5.50	5.50	5.50	5.40	5.40	5.40	5.30	5.20	5.10	5.10	4.90
96	11.60	6.50	6.10	5.90	5.90	5.80	5.80	5.70	5.60	5.60	5.60	5.50	5.50	5.50	5.40	5.30	5.20	5.20	5.00
97	11.80	6.60	6.20	6.00	6.00	5.90	5.90	5.80	5.70	5.70	5.70	5.60	5.60	5.60	5.50	5.40	5.30	5.30	5.10
98	12.00	6.70	6.30	6.10	6.10	6.00	6.00	5.90	5.80	5.80	5.80	5.70	5.70	5.70	5.60	5.50	5.40	5.40	5.20
99	12.20	6.80	6.40	6.20	6.20	6.10	6.10	6.00	5.90	5.90	5.90	5.80	5.80	5.80	5.70	5.60	5.50	5.50	5.30
100	12.40	6.90	6.50	6.30	6.30	6.20	6.10	6.10	6.00	6.00	6.00	5.90	5.90	5.90	5.80	5.70	5.60	5.60	5.40
101	12.60	7.00	6.60	6.40	6.40	6.30	6.20	6.20	6.10	6.10	6.10	6.00	6.00	6.00	5.90	5.80	5.70	5.70	5.50
102	12.80	7.10	6.70	6.50	6.50	6.40	6.30	6.30	6.20	6.20	6.20	6.10	6.10	6.10	6.00	5.90	5.80	5.80	5.60
103	13.00	7.20	6.80	6.60	6.60	6.50	6.40	6.40	6.30	6.30	6.30	6.20	6.20	6.20	6.10	6.00	5.90	5.90	5.70
104	13.20	7.30	6.90	6.80	6.70	6.60	6.50	6.50	6.40	6.40	6.40	6.30	6.30	6.30	6.20	6.10	6.00	6.00	5.80
105	13.40	7.40	7.00	6.90	6.80	6.70	6.70	6.60	6.50	6.50	6.50	6.40	6.40	6.40	6.30	6.20	6.10	6.10	5.90

106	13.60	7.50	7.10	7.00	6.90	6.80	6.80	6.70	6.60	6.60	6.60	6.50	6.50	6.50	6.40	6.30	6.20	6.20	6.00
107	13.80	7.60	7.20	7.10	7.00	6.90	6.90	6.80	6.70	6.70	6.70	6.60	6.60	6.60	6.50	6.40	6.30	6.30	6.10
108	14.00	7.70	7.30	7.20	7.10	7.00	7.00	6.90	6.80	6.80	6.80	6.70	6.70	6.70	6.60	6.50	6.40	6.40	6.20

APPENDIX I

DATA 5 - Longitudinal subsidence profile distance factors

File: Data5 'Number 5 file of 7'

	A	B	C	D	E	F	G	H	I	J	K	L
1	10.000	-0.140	-0.255	-0.335	-0.430	-0.490	-0.540	-0.590	-0.680	-0.755	-0.785	-0.970
2	11.000	-0.134	-0.249	-0.349	-0.423	-0.483	-0.532	-0.586	-0.672	-0.747	-0.781	-0.965
3	12.000	-0.128	-0.243	-0.343	-0.416	-0.476	-0.524	-0.578	-0.664	-0.739	-0.777	-0.960
4	13.000	-0.122	-0.237	-0.337	-0.409	-0.469	-0.516	-0.569	-0.656	-0.731	-0.773	-0.955
5	14.000	-0.116	-0.231	-0.331	-0.402	-0.462	-0.508	-0.562	-0.648	-0.723	-0.769	-0.950
6	15.000	-0.110	-0.225	-0.325	-0.395	-0.455	-0.500	-0.555	-0.640	-0.715	-0.765	-0.945
7	16.000	-0.105	-0.220	-0.320	-0.389	-0.449	-0.494	-0.550	-0.633	-0.708	-0.761	-0.940
8	17.000	-0.100	-0.215	-0.315	-0.383	-0.443	-0.488	-0.545	-0.626	-0.701	-0.757	-0.935
9	18.000	-0.095	-0.210	-0.310	-0.377	-0.437	-0.482	-0.540	-0.619	-0.694	-0.753	-0.930
10	19.000	-0.090	-0.205	-0.305	-0.371	-0.431	-0.476	-0.535	-0.612	-0.687	-0.749	-0.925
11	20.000	-0.085	-0.200	-0.300	-0.365	-0.425	-0.470	-0.530	-0.605	-0.680	-0.745	-0.920
12	21.000	-0.082	-0.195	-0.296	-0.360	-0.420	-0.465	-0.526	-0.599	-0.674	-0.742	-0.916
13	22.000	-0.079	-0.190	-0.292	-0.355	-0.415	-0.460	-0.522	-0.593	-0.668	-0.739	-0.912
14	23.000	-0.076	-0.185	-0.288	-0.350	-0.410	-0.455	-0.518	-0.587	-0.662	-0.736	-0.908
15	24.000	-0.073	-0.180	-0.284	-0.345	-0.405	-0.450	-0.514	-0.581	-0.656	-0.733	-0.904
16	25.000	-0.070	-0.175	-0.280	-0.340	-0.400	-0.445	-0.510	-0.575	-0.650	-0.730	-0.900
17	26.000	-0.067	-0.172	-0.276	-0.337	-0.396	-0.442	-0.507	-0.571	-0.646	-0.728	-0.896
18	27.000	-0.064	-0.169	-0.272	-0.334	-0.392	-0.439	-0.504	-0.567	-0.642	-0.726	-0.892
19	28.000	-0.061	-0.166	-0.268	-0.331	-0.388	-0.436	-0.501	-0.563	-0.638	-0.724	-0.888
20	29.000	-0.058	-0.163	-0.272	-0.328	-0.384	-0.433	-0.498	-0.559	-0.634	-0.722	-0.884
21	30.000	-0.055	-0.160	-0.270	-0.325	-0.380	-0.430	-0.495	-0.555	-0.630	-0.720	-0.880
22	31.000	-0.052	-0.157	-0.267	-0.322	-0.377	-0.427	-0.492	-0.552	-0.627	-0.718	-0.876
23	32.000	-0.051	-0.154	-0.264	-0.319	-0.375	-0.424	-0.489	-0.549	-0.624	-0.716	-0.872
24	33.000	-0.049	-0.151	-0.261	-0.316	-0.372	-0.421	-0.486	-0.546	-0.621	-0.714	-0.868
25	34.000	-0.047	-0.148	-0.258	-0.313	-0.369	-0.418	-0.483	-0.543	-0.618	-0.712	-0.864
26	35.000	-0.045	-0.145	-0.255	-0.310	-0.635	-0.415	-0.480	-0.540	-0.615	-0.710	-0.860
27	36.000	-0.043	-0.143	-0.253	-0.308	-0.362	-0.413	-0.478	-0.538	-0.612	-0.708	-0.856
28	37.000	-0.041	-0.141	-0.251	-0.306	-0.359	-0.411	-0.476	-0.536	-0.609	-0.706	-0.852
29	38.000	-0.039	-0.139	-0.249	-0.304	-0.356	-0.409	-0.474	-0.534	-0.606	-0.704	-0.848
30	39.000	-0.037	-0.137	-0.247	-0.302	-0.353	-0.407	-0.472	-0.532	-0.603	-0.702	-0.844
31	40.000	-0.035	-0.135	-0.245	-0.300	-0.350	-0.405	-0.470	-0.530	-0.600	-0.700	-0.840
32	41.000	-0.033	-0.133	-0.243	-0.298	-0.348	-0.403	-0.468	-0.527	-0.598	-0.698	-0.837
33	42.000	-0.031	-0.131	-0.241	-0.296	-0.346	-0.401	-0.466	-0.524	-0.596	-0.696	-0.834
34	43.000	-0.029	-0.129	-0.239	-0.294	-0.344	-0.399	-0.464	-0.521	-0.594	-0.694	-0.831
35	44.000	-0.027	-0.127	-0.237	-0.292	-0.342	-0.397	-0.462	-0.518	-0.592	-0.692	-0.828
36	45.000	-0.025	-0.125	-0.235	-0.290	-0.340	-0.395	-0.460	-0.515	-0.590	-0.690	-0.825
37	46.000	-0.024	-0.123	-0.233	-0.288	-0.338	-0.393	-0.458	-0.512	-0.587	-0.688	-0.822
38	47.000	-0.022	-0.121	-0.231	-0.286	-0.336	-0.391	-0.456	-0.510	-0.584	-0.686	-0.819
39	48.000	-0.020	-0.119	-0.229	-0.284	-0.334	-0.389	-0.454	-0.508	-0.581	-0.684	-0.816
40	49.000	-0.018	-0.117	-0.227	-0.282	-0.332	-0.387	-0.452	-0.506	-0.577	-0.682	-0.813
41	50.000	-0.016	-0.115	-0.225	-0.280	-0.330	-0.385	-0.450	-0.504	-0.575	-0.681	-0.810
42	51.000	-0.015	-0.113	-0.223	-0.278	-0.328	-0.383	-0.448	-0.502	-0.574	-0.679	-0.807
43	52.000	-0.014	-0.111	-0.221	-0.276	-0.326	-0.381	-0.446	-0.501	-0.572	-0.678	-0.804
44	53.000	-0.013	-0.109	-0.219	-0.274	-0.327	-0.379	-0.444	-0.499	-0.570	-0.677	-0.799
45	54.000	-0.012	-0.107	-0.217	-0.272	-0.325	-0.377	-0.442	-0.497	-0.571	-0.676	-0.797
46	55.000	-0.011	-0.105	-0.215	-0.270	-0.323	-0.375	-0.440	-0.495	-0.570	-0.675	-0.795
47	56.000	-0.010	-0.103	-0.214	-0.268	-0.322	-0.374	-0.438	-0.494	-0.567	-0.673	-0.792
48	57.000	-0.010	-0.101	-0.213	-0.266	-0.321	-0.373	-0.436	-0.493	-0.566	-0.671	-0.791
49	58.000	-0.009	-0.099	-0.212	-0.264	-0.319	-0.372	-0.434	-0.492	-0.564	-0.670	-0.789
50	59.000	-0.008	-0.097	-0.211	-0.262	-0.317	-0.371	-0.432	-0.491	-0.562	-0.667	-0.787

51	60.000	0.000	-0.095	-0.210	-0.260	-0.315	-0.370	-0.430	-0.490	-0.560	-0.665	-0.785
52	61.000	0.001	-0.094	-0.208	-0.259	-0.313	-0.369	-0.428	-0.488	-0.557	-0.664	-0.780
53	62.000	0.002	-0.093	-0.206	-0.256	-0.311	-0.366	-0.426	-0.486	-0.556	-0.663	-0.781
54	63.000	0.003	-0.092	-0.204	-0.257	-0.309	-0.367	-0.424	-0.484	-0.557	-0.662	-0.779
55	64.000	0.004	-0.091	-0.202	-0.256	-0.307	-0.366	-0.422	-0.482	-0.556	-0.661	-0.777
56	65.000	0.005	-0.090	-0.200	-0.255	-0.305	-0.365	-0.420	-0.480	-0.555	-0.660	-0.775
57	66.000	0.007	-0.088	-0.199	-0.254	-0.304	-0.363	-0.419	-0.478	-0.554	-0.659	-0.774
58	67.000	0.009	-0.086	-0.198	-0.253	-0.303	-0.361	-0.418	-0.476	-0.553	-0.658	-0.773
59	68.000	0.011	-0.084	-0.197	-0.252	-0.302	-0.359	-0.417	-0.474	-0.552	-0.657	-0.772
60	69.000	0.013	-0.082	-0.196	-0.251	-0.301	-0.357	-0.416	-0.472	-0.551	-0.656	-0.771
61	70.000	0.015	-0.080	-0.195	-0.250	-0.300	-0.355	-0.415	-0.470	-0.550	-0.655	-0.770
62	71.000	0.016	-0.079	-0.193	-0.248	-0.298	-0.354	-0.414	-0.467	-0.548	-0.653	-0.768
63	72.000	0.017	-0.078	-0.191	-0.246	-0.296	-0.353	-0.413	-0.466	-0.546	-0.651	-0.766
64	73.000	0.018	-0.077	-0.190	-0.244	-0.294	-0.352	-0.412	-0.467	-0.544	-0.649	-0.764
65	74.000	0.019	-0.076	-0.187	-0.242	-0.292	-0.351	-0.411	-0.466	-0.542	-0.647	-0.762
66	75.000	0.020	-0.075	-0.185	-0.240	-0.290	-0.350	-0.410	-0.465	-0.540	-0.645	-0.760
67	80.000	0.025	-0.070	-0.180	-0.235	-0.285	-0.345	-0.400	-0.455	-0.535	-0.640	-0.755
68	85.000	0.030	-0.065	-0.175	-0.230	-0.280	-0.335	-0.395	-0.450	-0.530	-0.635	-0.750
69	90.000	0.040	-0.055	-0.165	-0.225	-0.275	-0.330	-0.390	-0.445	-0.525	-0.630	-0.745
70	95.000	0.045	-0.050	-0.160	-0.220	-0.270	-0.325	-0.385	-0.440	-0.520	-0.625	-0.740
71	100.000	0.050	-0.050	-0.155	-0.215	-0.265	-0.320	-0.380	-0.435	-0.515	-0.620	-0.735
72	110.000	0.060	-0.040	-0.145	-0.205	-0.255	-0.310	-0.370	-0.425	-0.505	-0.610	-0.725
73	120.000	0.070	-0.030	-0.140	-0.195	-0.250	-0.305	-0.360	-0.415	-0.495	-0.600	-0.715
74	130.000	0.080	-0.025	-0.130	-0.190	-0.240	-0.295	-0.350	-0.405	-0.485	-0.590	-0.705
75	140.000	0.085	-0.015	-0.125	-0.185	-0.235	-0.290	-0.340	-0.400	-0.480	-0.580	-0.695
76	150.000	0.095	-0.010	-0.115	-0.175	-0.225	-0.285	-0.335	-0.390	-0.470	-0.575	-0.690
77	160.000	0.100	-0.005	-0.110	-0.170	-0.220	-0.275	-0.330	-0.385	-0.465	-0.565	-0.680
78	170.000	0.110	0.000	-0.100	-0.165	-0.215	-0.270	-0.325	-0.380	-0.460	-0.560	-0.675
79	180.000	0.115	0.005	-0.095	-0.160	-0.210	-0.265	-0.320	-0.375	-0.455	-0.555	-0.670
80	190.000	0.120	0.010	-0.090	-0.155	-0.205	-0.260	-0.315	-0.370	-0.450	-0.550	-0.665
81	200.000	0.125	0.015	-0.085	-0.150	-0.200	-0.255	-0.310	-0.370	-0.445	-0.545	-0.665
82	210.000	0.130	0.020	-0.080	-0.145	-0.200	-0.250	-0.305	-0.365	-0.440	-0.540	-0.665
83	220.000	0.135	0.020	-0.075	-0.140	-0.195	-0.250	-0.300	-0.360	-0.440	-0.535	-0.660
84	230.000	0.135	0.025	-0.070	-0.140	-0.195	-0.245	-0.300	-0.360	-0.440	-0.535	-0.660
85	240.000	0.140	0.030	-0.070	-0.135	-0.190	-0.245	-0.300	-0.355	-0.435	-0.535	-0.660
86	250.000	0.145	0.030	-0.065	-0.135	-0.190	-0.240	-0.295	-0.355	-0.430	-0.530	-0.655
87	260.000	0.145	0.035	-0.060	-0.130	-0.185	-0.240	-0.290	-0.350	-0.430	-0.525	-0.655
88	270.000	0.145	0.035	-0.060	-0.130	-0.185	-0.235	-0.290	-0.345	-0.425	-0.525	-0.650
89	280.000	0.150	0.040	-0.060	-0.125	-0.180	-0.235	-0.290	-0.345	-0.425	-0.525	-0.650
90	290.000	0.150	0.040	-0.060	-0.125	-0.180	-0.230	-0.285	-0.340	-0.420	-0.525	-0.650
91	300.000	0.150	0.040	-0.060	-0.125	-0.180	-0.230	-0.285	-0.340	-0.420	-0.525	-0.650
92	310.000	0.150	0.040	-0.060	-0.125	-0.180	-0.230	-0.285	-0.340	-0.420	-0.525	-0.650
93	320.000	0.150	0.040	-0.060	-0.125	-0.180	-0.230	-0.285	-0.340	-0.420	-0.525	-0.650
94	330.000	0.150	0.040	-0.060	-0.125	-0.180	-0.230	-0.285	-0.340	-0.420	-0.525	-0.650
95	340.000	0.150	0.040	-0.060	-0.125	-0.180	-0.230	-0.285	-0.340	-0.420	-0.525	-0.650
96	350.000	0.150	0.040	-0.060	-0.125	-0.180	-0.230	-0.285	-0.340	-0.420	-0.525	-0.650
97	360.000	0.150	0.040	-0.060	-0.125	-0.180	-0.230	-0.285	-0.340	-0.420	-0.525	-0.650
98	380.000	0.150	0.040	-0.060	-0.125	-0.180	-0.230	-0.285	-0.340	-0.420	-0.525	-0.650
99	400.000	0.150	0.040	-0.060	-0.125	-0.180	-0.230	-0.285	-0.340	-0.420	-0.525	-0.650
100	420.000	0.150	0.040	-0.060	-0.125	-0.180	-0.230	-0.285	-0.340	-0.420	-0.525	-0.650

101	440.000	0.150	0.040	-0.060	-0.125	-0.180	-0.230	-0.285	-0.340	-0.420	-0.525	-0.640
102	460.000	0.150	0.040	-0.060	-0.125	-0.180	-0.230	-0.285	-0.340	-0.420	-0.525	-0.640
103	480.000	0.150	0.040	-0.060	-0.125	-0.180	-0.230	-0.285	-0.340	-0.420	-0.525	-0.640
104	500.000	0.150	0.040	-0.060	-0.125	-0.180	-0.230	-0.285	-0.340	-0.420	-0.525	-0.640
105	525.000	0.150	0.040	-0.060	-0.125	-0.180	-0.230	-0.285	-0.340	-0.420	-0.525	-0.640
106	550.000	0.150	0.040	-0.060	-0.125	-0.180	-0.230	-0.285	-0.340	-0.420	-0.525	-0.640
107	575.000	0.150	0.040	-0.060	-0.125	-0.180	-0.230	-0.285	-0.340	-0.420	-0.525	-0.640
108	600.000	0.150	0.040	-0.060	-0.125	-0.180	-0.230	-0.285	-0.340	-0.420	-0.525	-0.640
109	625.000	0.150	0.040	-0.060	-0.125	-0.180	-0.230	-0.285	-0.340	-0.420	-0.525	-0.640
110	650.000	0.150	0.040	-0.060	-0.125	-0.180	-0.230	-0.285	-0.340	-0.420	-0.525	-0.640
111	675.000	0.150	0.040	-0.060	-0.125	-0.180	-0.230	-0.285	-0.340	-0.420	-0.525	-0.640
112	700.000	0.150	0.040	-0.060	-0.125	-0.180	-0.230	-0.285	-0.340	-0.420	-0.525	-0.640
113	725.000	0.150	0.040	-0.060	-0.125	-0.180	-0.230	-0.285	-0.340	-0.420	-0.525	-0.640
114	750.000	0.150	0.040	-0.060	-0.125	-0.180	-0.230	-0.285	-0.340	-0.420	-0.525	-0.640
115	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

APPENDIX J

DATA 6 - Longitudinal strain profile distance factors

File: Data6 'Number 6 file of 7'

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	10.000	0.120	0.025	-0.075	-0.140	-0.185	-0.255	-0.300	0.000	-0.415	-0.470	-0.490	-0.545	-0.600	-0.740	-0.840
2	11.000	0.124	0.020	-0.071	-0.135	-0.180	-0.250	-0.295	0.000	-0.410	-0.465	-0.485	-0.540	-0.630	-0.730	-0.830
3	12.000	0.128	0.015	-0.067	-0.130	-0.175	-0.245	-0.290	0.000	-0.405	-0.460	-0.480	-0.535	-0.630	-0.730	-0.830
4	13.000	0.132	0.010	-0.063	-0.125	-0.170	-0.240	-0.285	0.000	-0.400	-0.455	-0.475	-0.530	-0.640	-0.720	-0.820
5	14.000	0.136	0.005	-0.059	-0.120	-0.165	-0.235	-0.280	0.000	-0.395	-0.450	-0.470	-0.525	-0.640	-0.720	-0.810
6	15.000	0.140	0.000	-0.055	-0.115	-0.160	-0.230	-0.275	0.000	-0.390	-0.445	-0.465	-0.520	-0.630	-0.710	-0.800
7	16.000	0.143	0.004	-0.051	-0.111	-0.156	-0.226	-0.272	0.000	-0.386	-0.441	-0.462	-0.515	-0.630	-0.710	-0.800
8	17.000	0.146	0.008	-0.047	-0.107	-0.152	-0.222	-0.269	0.000	-0.382	-0.437	-0.459	-0.510	-0.620	-0.700	-0.790
9	18.000	0.149	0.012	-0.043	-0.103	-0.148	-0.218	-0.266	0.000	-0.378	-0.433	-0.456	-0.505	-0.610	-0.700	-0.780
10	19.000	0.152	0.016	-0.039	-0.099	-0.144	-0.214	-0.263	0.000	-0.374	-0.429	-0.453	-0.500	-0.600	-0.690	-0.770
11	20.000	0.155	0.020	-0.035	-0.095	-0.140	-0.210	-0.260	0.000	-0.370	-0.425	-0.450	-0.495	-0.590	-0.680	-0.770
12	21.000	0.156	0.023	-0.032	-0.091	-0.134	-0.206	-0.256	0.000	-0.367	-0.420	-0.446	-0.492	-0.590	-0.680	-0.770
13	22.000	0.161	0.026	-0.029	-0.087	-0.128	-0.202	-0.252	0.000	-0.364	-0.415	-0.442	-0.489	-0.580	-0.660	-0.760
14	23.000	0.164	0.029	-0.026	-0.083	-0.122	-0.198	-0.248	0.000	-0.361	-0.410	-0.438	-0.486	-0.580	-0.660	-0.750
15	24.000	0.167	0.032	-0.023	-0.079	-0.116	-0.194	-0.244	0.000	-0.358	-0.405	-0.434	-0.482	-0.580	-0.670	-0.750
16	25.000	0.170	0.035	-0.020	-0.075	-0.110	-0.190	-0.240	0.000	-0.355	-0.400	-0.430	-0.480	-0.570	-0.670	-0.750
17	26.000	0.173	0.037	-0.018	-0.072	-0.108	-0.188	-0.238	0.000	-0.353	-0.397	-0.428	-0.477	-0.570	-0.670	-0.730
18	27.000	0.176	0.039	-0.016	-0.069	-0.106	-0.186	-0.236	0.000	-0.351	-0.394	-0.426	-0.474	-0.570	-0.670	-0.730
19	28.000	0.178	0.041	0.014	-0.066	-0.104	-0.184	-0.234	0.000	-0.349	-0.391	-0.424	-0.471	-0.570	-0.670	-0.730
20	29.000	0.181	0.043	0.012	-0.063	-0.102	-0.182	-0.232	0.000	-0.347	-0.389	-0.422	-0.468	-0.560	-0.660	-0.740
21	30.000	0.183	0.045	0.010	-0.060	-0.100	-0.180	-0.230	0.000	-0.345	-0.385	-0.420	-0.465	-0.560	-0.660	-0.740
22	31.000	0.185	0.048	0.008	-0.058	-0.098	-0.178	-0.228	0.000	-0.343	-0.382	-0.418	-0.463	-0.560	-0.660	-0.740
23	32.000	0.187	0.051	0.006	-0.056	-0.096	-0.176	-0.226	0.000	-0.341	-0.379	-0.416	-0.461	-0.560	-0.660	-0.740
24	33.000	0.189	0.053	0.004	-0.054	-0.094	-0.174	-0.224	0.000	-0.339	-0.376	-0.414	-0.459	-0.560	-0.660	-0.740
25	34.000	0.191	0.055	0.002	-0.052	-0.092	-0.172	-0.222	0.000	-0.337	-0.373	-0.412	-0.457	-0.550	-0.650	-0.730
26	35.000	0.193	0.057	0.000	-0.050	-0.090	-0.170	-0.220	0.000	-0.335	-0.370	-0.410	-0.455	-0.550	-0.650	-0.730
27	36.000	0.195	0.060	0.002	-0.048	-0.088	-0.168	-0.218	0.000	-0.335	-0.367	-0.408	-0.453	-0.550	-0.650	-0.730
28	37.000	0.197	0.063	0.004	-0.046	-0.086	-0.166	-0.216	0.000	-0.331	-0.364	-0.406	-0.451	-0.550	-0.650	-0.730
29	38.000	0.199	0.066	0.006	-0.044	-0.840	-0.164	-0.214	0.000	-0.329	-0.361	-0.404	-0.449	-0.540	-0.640	-0.720
30	39.000	0.201	0.068	0.008	-0.042	-0.082	-0.162	-0.212	0.000	-0.327	-0.358	-0.402	-0.447	-0.540	-0.640	-0.720
31	40.000	0.203	0.070	0.010	-0.040	-0.080	-0.160	-0.210	0.000	-0.325	-0.355	-0.400	-0.445	-0.540	-0.640	-0.720
32	41.000	0.206	0.072	0.012	-0.038	-0.078	-0.158	-0.208	0.000	-0.322	-0.354	-0.398	-0.443	-0.540	-0.640	-0.720
33	42.000	0.209	0.074	0.014	-0.036	-0.076	-0.156	-0.206	0.000	-0.321	-0.353	-0.396	-0.441	-0.540	-0.640	-0.720
34	43.000	0.211	0.076	0.016	-0.034	-0.074	-0.154	-0.204	0.000	-0.319	-0.352	-0.394	-0.439	-0.530	-0.630	-0.710
35	44.000	0.213	0.078	0.018	-0.032	-0.072	-0.152	-0.202	0.000	-0.317	-0.351	-0.392	-0.437	-0.530	-0.630	-0.710
36	45.000	0.215	0.080	0.020	-0.030	-0.070	-0.150	-0.200	0.000	-0.315	-0.350	-0.390	-0.435	-0.530	-0.630	-0.710
37	46.000	0.217	0.082	0.022	-0.027	-0.069	-0.148	-0.198	0.000	-0.314	-0.348	-0.387	-0.433	-0.530	-0.630	-0.710
38	47.000	0.219	0.084	0.024	-0.025	-0.068	-0.146	-0.196	0.000	-0.312	-0.346	-0.385	-0.431	-0.530	-0.630	-0.710
39	48.000	0.221	0.085	0.025	-0.027	-0.067	-0.144	-0.194	0.000	-0.312	-0.344	-0.387	-0.429	-0.520	-0.620	-0.700
40	49.000	0.223	0.086	0.026	-0.026	-0.066	-0.142	-0.192	0.000	-0.311	-0.342	-0.386	-0.427	-0.520	-0.620	-0.700
41	50.000	0.225	0.087	0.027	-0.025	-0.065	-0.140	-0.190	0.000	-0.310	-0.340	-0.385	-0.425	-0.520	-0.620	-0.700
42	51.000	0.227	0.089	0.029	-0.023	-0.064	-0.138	-0.188	0.000	-0.308	-0.339	-0.382	-0.423	-0.520	-0.620	-0.700
43	52.000	0.229	0.091	0.031	-0.021	-0.063	-0.136	-0.186	0.000	-0.306	-0.336	-0.381	-0.421	-0.520	-0.620	-0.700
44	53.000	0.230	0.092	0.033	-0.019	-0.062	-0.134	-0.184	0.000	-0.304	-0.337	-0.379	-0.419	-0.510	-0.610	-0.700
45	54.000	0.231	0.093	0.035	-0.017	-0.061	-0.132	-0.182	0.000	-0.302	-0.336	-0.377	-0.417	-0.510	-0.610	-0.700
46	55.000	0.232	0.095	0.037	-0.015	-0.060	-0.130	-0.180	0.000	-0.300	-0.335	-0.375	-0.415	-0.510	-0.610	-0.700
47	56.000	0.234	0.097	0.039	-0.013	-0.058	-0.129	-0.179	0.000	-0.299	-0.333	-0.373	-0.414	-0.510	-0.610	-0.700
48	57.000	0.236	0.099	0.041	-0.011	-0.056	-0.128	-0.178	0.000	-0.298	-0.331	-0.371	-0.413	-0.510	-0.610	-0.700
49	58.000	0.237	0.100	0.042	-0.009	-0.054	-0.127	-0.177	0.000	-0.297	-0.329	-0.369	-0.412	-0.510	-0.610	-0.700
50	59.000	0.239	0.102	0.044	-0.007	-0.052	-0.126	-0.176	0.000	-0.296	-0.327	-0.367	-0.411	-0.500	-0.610	-0.690

51	60.000	0.240	0.103	0.045	-0.009	-0.050	-0.125	-0.175	0.000	-0.295	-0.325	-0.365	-0.410	-0.500	-0.610	-0.690
52	61.000	0.242	0.105	0.046	-0.005	-0.049	-0.124	-0.174	0.000	-0.294	-0.323	-0.364	-0.408	-0.500	-0.610	-0.690
53	62.000	0.244	0.107	0.047	-0.004	-0.048	-0.123	-0.173	0.000	-0.293	-0.321	-0.363	-0.406	-0.500	-0.600	-0.690
54	63.000	0.245	0.108	0.048	-0.004	-0.047	-0.122	-0.172	0.000	-0.292	-0.319	-0.362	-0.404	-0.500	-0.600	-0.680
55	64.000	0.246	0.109	0.049	-0.003	-0.046	-0.121	-0.171	0.000	-0.291	-0.317	-0.361	-0.402	-0.490	-0.600	-0.680
56	65.000	0.247	0.110	0.050	-0.003	-0.045	-0.120	-0.170	0.000	-0.290	-0.315	-0.360	-0.400	-0.490	-0.600	-0.680
57	66.000	0.249	0.111	0.052	-0.001	-0.044	-0.118	-0.168	0.000	-0.288	-0.314	-0.358	-0.399	-0.490	-0.600	-0.680
58	67.000	0.251	0.112	0.053	0.001	0.043	-0.116	-0.166	0.000	-0.286	-0.313	-0.350	-0.398	-0.490	-0.600	-0.680
59	68.000	0.252	0.113	0.054	0.003	-0.042	-0.114	-0.164	0.000	-0.284	-0.312	-0.354	-0.397	-0.490	-0.600	-0.680
60	69.000	0.253	0.114	0.055	0.006	-0.041	-0.112	-0.162	0.000	-0.282	-0.311	-0.352	-0.396	-0.490	-0.600	-0.670
61	70.000	0.253	0.115	0.056	0.009	-0.040	-0.110	-0.160	0.000	-0.280	-0.310	-0.350	-0.395	-0.490	-0.600	-0.670
62	71.000	0.255	0.177	0.058	0.011	-0.035	-0.109	-0.159	0.000	-0.278	-0.309	-0.348	-0.393	-0.490	-0.600	-0.670
63	72.000	0.256	0.118	0.060	0.012	-0.036	-0.108	-0.158	0.000	-0.276	-0.308	-0.346	-0.391	-0.490	-0.600	-0.670
64	73.000	0.257	0.119	0.061	0.013	-0.034	-0.107	-0.157	0.000	-0.274	-0.307	-0.344	-0.389	-0.490	-0.600	-0.670
65	74.000	0.258	0.121	0.062	0.014	-0.032	-0.106	-0.156	0.000	-0.272	-0.306	-0.342	-0.387	-0.480	-0.590	-0.670
66	75.000	0.260	0.123	0.063	0.015	-0.030	-0.105	-0.155	0.000	-0.270	-0.305	-0.340	-0.385	-0.480	-0.590	-0.670
67	80.000	0.268	0.130	0.070	0.023	-0.025	-0.100	-0.150	0.000	-0.265	-0.300	-0.335	-0.380	-0.470	-0.580	-0.660
68	85.000	0.273	0.140	0.075	0.030	-0.020	-0.095	-0.140	0.000	-0.260	-0.295	-0.330	-0.375	-0.470	-0.580	-0.650
69	90.000	0.280	0.144	0.080	0.035	-0.010	-0.090	-0.135	0.000	-0.255	-0.290	-0.325	-0.365	-0.460	-0.570	-0.640
70	95.000	0.285	0.147	0.090	0.040	0.000	-0.080	-0.130	0.000	-0.250	-0.285	-0.320	-0.360	-0.460	-0.570	-0.640
71	100.000	0.290	0.154	0.095	0.050	0.000	-0.075	-0.125	0.000	-0.250	-0.280	-0.315	-0.355	-0.450	-0.560	-0.630
72	110.000	0.300	0.165	0.105	0.060	0.010	-0.065	-0.115	0.000	-0.235	-0.270	-0.305	-0.345	-0.440	-0.550	-0.620
73	120.000	0.310	0.175	0.115	0.070	0.020	-0.055	-0.105	0.000	-0.225	-0.260	-0.295	-0.340	-0.430	-0.540	-0.610
74	130.000	0.320	0.185	0.122	0.075	0.035	-0.045	-0.095	0.000	-0.220	-0.250	-0.290	-0.330	-0.420	-0.530	-0.610
75	140.000	0.328	0.192	0.131	0.085	0.040	-0.035	-0.085	0.000	-0.210	-0.245	-0.280	-0.320	-0.420	-0.530	-0.600
76	150.000	0.335	0.200	0.140	0.095	0.050	-0.030	-0.080	0.000	-0.205	-0.235	-0.275	-0.315	-0.410	-0.520	-0.590
77	160.000	0.342	0.206	0.147	0.100	0.060	-0.020	-0.075	0.000	-0.200	-0.230	-0.270	-0.305	-0.400	-0.510	-0.580
78	170.000	0.350	0.214	0.154	0.110	0.065	-0.015	-0.070	0.000	-0.190	-0.229	-0.260	-0.300	-0.400	-0.500	-0.580
79	180.000	0.355	0.219	0.160	0.115	0.070	-0.010	-0.065	0.000	-0.170	-0.220	-0.255	-0.295	-0.390	-0.500	-0.570
80	190.000	0.360	0.235	0.165	0.120	0.075	0.000	-0.060	0.000	-0.180	-0.210	-0.250	-0.290	-0.390	-0.500	-0.560
81	200.000	0.365	0.230	0.170	0.125	0.080	0.010	-0.550	0.000	-0.180	-0.210	-0.250	-0.285	-0.380	-0.490	-0.560
82	210.000	0.370	0.235	0.175	0.130	0.080	0.010	-0.050	0.000	-0.175	-0.205	-0.240	-0.280	-0.380	-0.490	-0.560
83	220.000	0.374	0.239	0.180	0.135	0.085	0.015	-0.045	0.000	-0.170	-0.200	-0.240	-0.275	-0.380	-0.480	-0.550
84	230.000	0.377	0.243	0.184	0.140	0.090	0.015	-0.040	0.000	-0.165	-0.200	-0.235	-0.275	-0.370	-0.480	-0.550
85	240.000	0.380	0.245	0.186	0.140	0.090	0.020	-0.035	0.000	-0.160	-0.195	-0.230	-0.270	-0.370	-0.470	-0.550
86	250.000	0.384	0.248	0.190	0.140	0.095	0.020	-0.035	0.000	-0.160	-0.195	-0.230	-0.270	-0.370	-0.470	-0.540
87	260.000	0.385	0.249	0.192	0.145	0.095	0.025	-0.030	0.000	-0.155	-0.190	-0.225	-0.265	-0.360	-0.470	-0.540
88	270.000	0.388	0.250	0.194	0.145	0.100	0.025	-0.030	0.000	-0.150	-0.190	-0.220	-0.260	-0.360	-0.470	-0.540
89	280.000	0.390	0.250	0.195	0.150	0.100	0.030	-0.025	0.000	-0.150	-0.185	-0.220	-0.260	-0.360	-0.460	-0.530
90	290.000	0.391	0.250	0.195	0.150	0.100	0.030	-0.025	0.000	-0.150	-0.185	-0.215	-0.255	-0.360	-0.460	-0.530
91	300.000	0.392	0.250	0.195	0.150	0.100	0.030	-0.020	0.000	-0.150	-0.180	-0.210	-0.250	-0.360	-0.460	-0.530
92	310.000	0.393	0.250	0.195	0.150	0.100	0.030	-0.020	0.000	-0.150	-0.180	-0.210	-0.250	-0.360	-0.460	-0.530
93	320.000	0.395	0.250	0.195	0.150	0.100	0.030	-0.020	0.000	-0.150	-0.180	-0.210	-0.250	-0.360	-0.460	-0.530
94	330.000	0.393	0.250	0.195	0.150	0.100	0.030	-0.020	0.000	-0.150	-0.180	-0.210	-0.250	-0.360	-0.460	-0.530
95	340.000	0.395	0.250	0.195	0.150	0.100	0.030	-0.020	0.000	-0.150	-0.180	-0.210	-0.250	-0.360	-0.460	-0.530
96	350.000	0.395	0.250	0.195	0.150	0.100	0.030	-0.020	0.000	-0.150	-0.180	-0.210	-0.250	-0.360	-0.460	-0.530
97	360.000	0.395	0.250	0.195	0.150	0.100	0.030	-0.020	0.000	-0.150	-0.180	-0.210	-0.250	-0.360	-0.460	-0.530
98	380.000	0.395	0.250	0.195	0.150	0.100	0.030	-0.020	0.000	-0.150	-0.180	-0.210	-0.250	-0.360	-0.460	-0.530
99	400.000	0.395	0.250	0.195	0.150	0.100	0.030	-0.020	0.000	-0.150	-0.180	-0.210	-0.250	-0.360	-0.460	-0.530
100	420.000	0.395	0.250	0.195	0.150	0.100	0.030	-0.020	0.000	-0.150	-0.180	-0.210	-0.250	-0.360	-0.460	-0.530

101	440.000	0.395	0.250	0.195	0.150	0.100	0.030	-0.020	0.000	-0.150	-0.180	-0.210	-0.250	-0.360	-0.460	-0.530
102	460.000	0.395	0.250	0.195	0.150	0.100	0.030	-0.020	0.000	-0.150	-0.180	-0.210	-0.250	-0.360	-0.460	-0.530
103	480.000	0.395	0.250	0.195	0.150	0.100	0.030	-0.020	0.000	-0.150	-0.180	-0.210	-0.250	-0.360	-0.460	-0.530
104	500.000	0.395	0.250	0.195	0.150	0.100	0.030	-0.020	0.000	-0.150	-0.180	-0.210	-0.250	-0.360	-0.460	-0.530
105	525.000	0.395	0.250	0.195	0.150	0.100	0.030	-0.020	0.000	-0.150	-0.180	-0.210	-0.250	-0.360	-0.460	-0.530
106	550.000	0.395	0.250	0.195	0.150	0.100	0.030	-0.020	0.000	-0.150	-0.180	-0.210	-0.250	-0.360	-0.460	-0.530
107	575.000	0.395	0.250	0.195	0.150	0.100	0.030	-0.020	0.000	-0.150	-0.180	-0.210	-0.250	-0.360	-0.460	-0.530
108	600.000	0.395	0.250	0.195	0.150	0.100	0.030	-0.020	0.000	-0.150	-0.180	-0.210	-0.250	-0.360	-0.460	-0.530
109	625.000	0.395	0.250	0.195	0.150	0.100	0.030	-0.020	0.000	-0.150	-0.180	-0.210	-0.250	-0.360	-0.460	-0.530
110	650.000	0.395	0.250	0.195	0.150	0.100	0.030	-0.020	0.000	-0.150	-0.180	-0.210	-0.250	-0.360	-0.460	-0.530
111	675.000	0.395	0.250	0.195	0.150	0.100	0.030	-0.020	0.000	-0.150	-0.180	-0.210	-0.250	-0.360	-0.460	-0.530
112	700.000	0.395	0.250	0.195	0.150	0.100	0.030	-0.020	0.000	-0.150	-0.180	-0.210	-0.250	-0.360	-0.460	-0.530
113	725.000	0.395	0.250	0.195	0.150	0.100	0.030	-0.020	0.000	-0.150	-0.180	-0.210	-0.250	-0.360	-0.460	-0.530
114	750.000	0.395	0.250	0.195	0.150	0.100	0.030	-0.020	0.000	-0.150	-0.180	-0.210	-0.250	-0.360	-0.460	-0.530

APPENDIX K

DATA 7 - Correction factors for the effect of seam gradient on tensile strain

Table Data7 Number 7 file of 7

	A	B	C
1	1.00	0.00	0.00
2	1.50	0.29	1.71
3	1.75	0.32	1.68
4	2.00	0.33	1.65
5	2.25	0.38	1.62
6	2.50	0.41	1.59
7	2.75	0.44	1.56
8	3.00	0.46	1.54
9	3.25	0.47	1.53
10	3.50	0.51	1.49
11	3.75	0.54	1.46
12	4.00	0.56	1.44
13	4.25	0.58	1.42
14	4.50	0.60	1.40
15	4.75	0.62	1.38
16	5.00	0.64	1.36
17	5.25	0.67	1.33
18	5.50	0.69	1.31
19	5.75	0.71	1.29
20	6.00	0.73	1.27
21	6.25	0.75	1.25
22	6.50	0.76	1.24
23	6.75	0.78	1.22
24	7.00	0.80	1.20
25	7.25	0.82	1.18
26	7.50	0.83	1.17
27	7.75	0.84	1.16
28	8.00	0.85	1.15
29	8.25	0.86	1.14
30	8.50	0.87	1.13
31	8.75	0.88	1.12
32	9.00	0.89	1.11
33	9.25	0.90	1.10
34	9.50	0.91	1.09
35	9.75	0.92	1.08
36	10.00	0.92	1.08